

MOTOR AGE

VOLUME XXII

CHICAGO, SEPTEMBER 5, 1912

NUMBER 10

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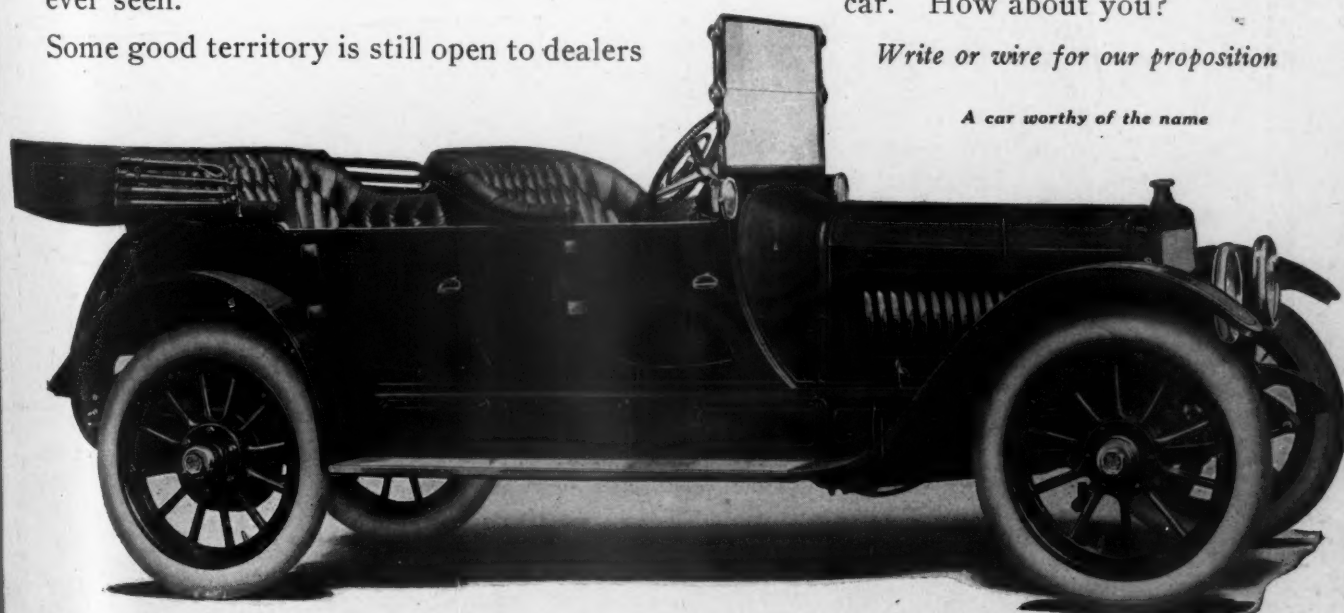
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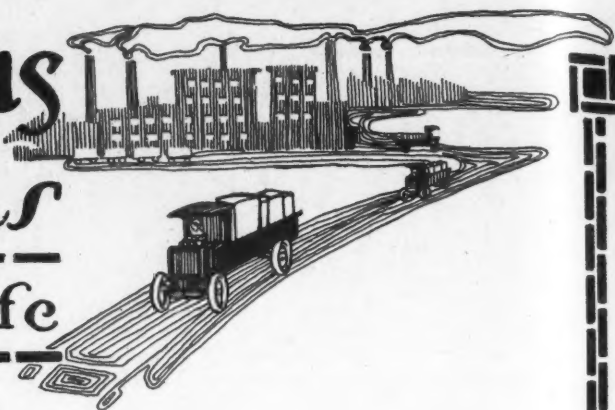
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3-Ton
Truck
\$3200



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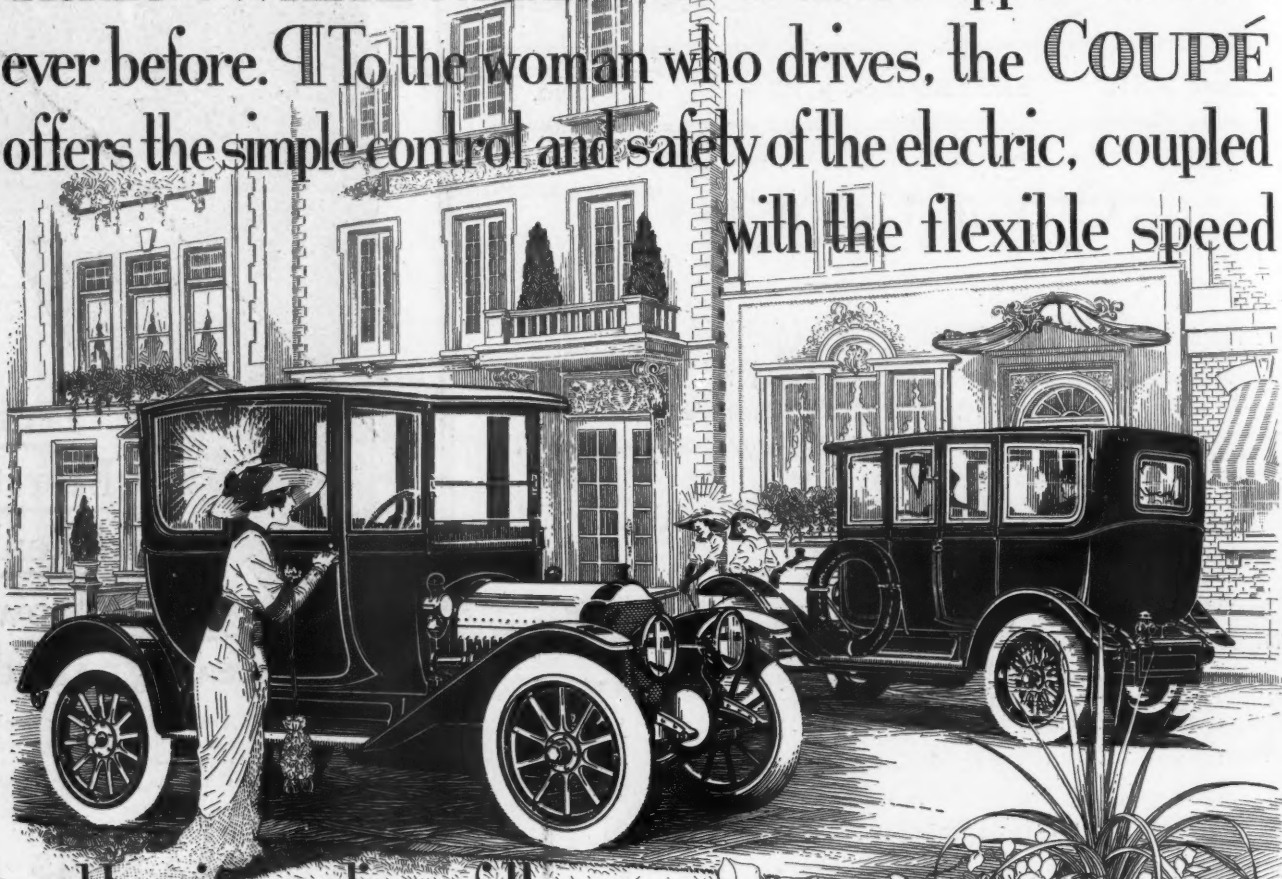
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DE PALMA TOPPING ROBINSON'S HILL WITH THREE WHEELS OFF THE GROUND

DePalma Star of the Elgin Road Races

*Mercedes Driver Not Only Wins Elgin Trophy Event But Takes Free-For-All As Well—
Stutz Wins Illinois Cup, Mercer the Aurora and Mason Small-Car Event*

CHICAGO, Sept. 2—Ralph de Palma's luck has changed. After meeting with discouragement after discouragement all through his road racing career in which he always has been an important factor, the Italian-American driver came into his own last Saturday when he scored a double victory in the third annual road race meet at Elgin, conducted this year by the Chicago Automobile Club instead of the Chicago Motor Club, and the Elgin Automobile Road Racing Association. All the races were non-stock. De Palma driving R. J. Schroeder's Mercedes, the same one he had at Indianapolis, won not only the Elgin National Watch Co. trophy race for cars under 600 inches, but he continued his victorious pace and annexed the free-for-all as well at 68.9 miles

Results of Elgin Races

FREE-FOR-ALL		
Pos.	Car and driver	M. P. H.
1	Mercedes, de Palma	68.9
2	Benz, Bergdoll	67.5
3	Knox six, Mulford	66.6
ELGIN TROPHY		
1	Mercedes, de Palma	68.4
2	Knox six, Mulford	67.4
3	Stutz, Merz	64.2
4	Mason, Roberts	63.8
5	Stutz, Anderson	63.3
ILLINOIS TROPHY		
1	Stutz, Merz	66.11
2	Stutz, Anderson	65.6
AURORA TROPHY		
1	Mercer, Hughes	65.0
2	Mercer, Pullen	62.3
3	Falcar, Trussel	54.06
4	Mason, Roberts	51.4
5	Falcar, Hastings	49.9
JENCKS TROPHY		
1	Mason, Endicott	60.57

per hour. In the Elgin he did 68.4 miles per hour. The previous course record was 66.45 miles per hour, made by Zengel.

The meet was a great and glorious success and reflects great credit on the Chicago Automobile Club, which took hold of the affair after it had been dropped by the Chicago Motor Club and in 7 weeks' time organized the meet and secured a field of starters that for brilliancy never before has been equaled at Elgin. In all five races were run, one more than in previous years. De Palma won both on the second day, while the three curtain-raising races on Friday, when the smaller events were run off, were taken by the Mason, Mercer and Stutz. The Mason won the Fred W. Jencks trophy for cars 230 inches and under at an average pace



RALPH DE PALMA, DOUBLE WINNER AT ELGIN

of 60.5 miles per hour; the Mercer driven by Hughes, repeated last year's performance by taking the 231-300 class in which the Aurora trophy was the consideration instead of the Kane County cup, at a pace of 65 miles per hour; while the Illinois cup, won last year and the year before by the National, went to Merz in the Stutz at 66.11 miles per hour.

Warm Contests on Second Day

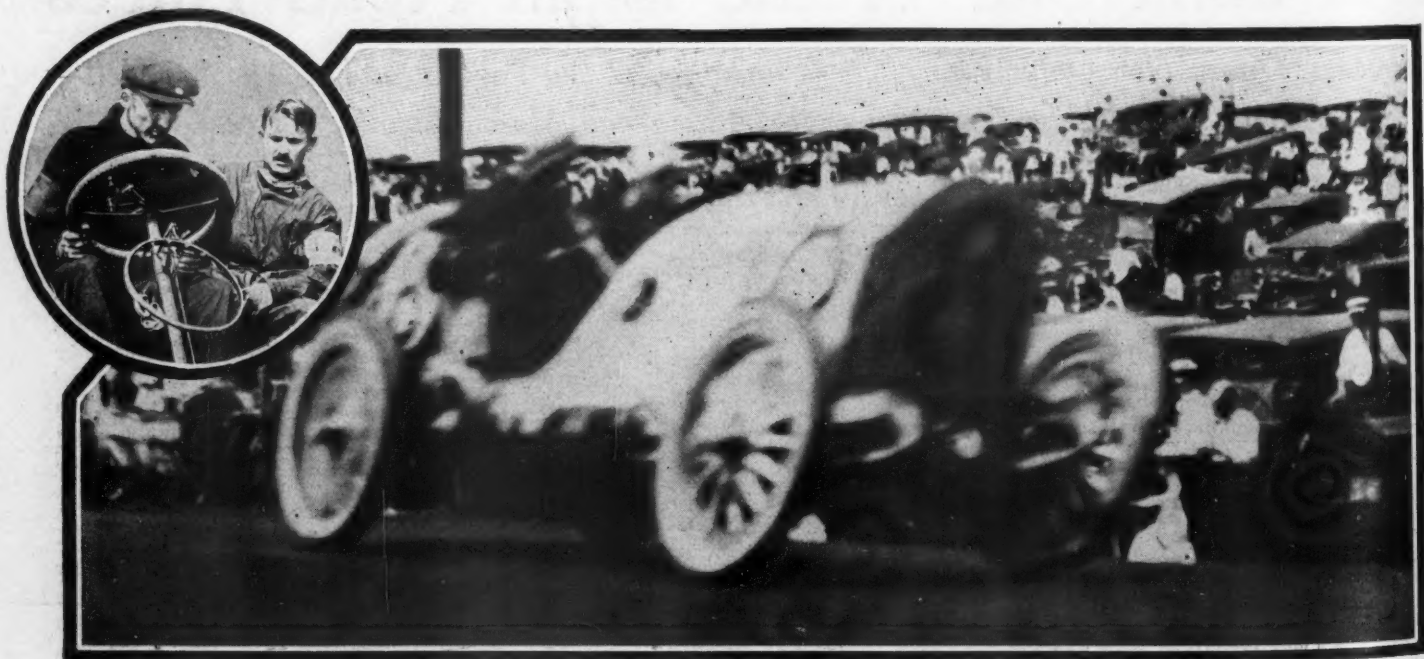
While the races the first day were not productive of close finishes, the second session more than made up for this, for it was a see-saw all the way in the Elgin trophy race between de Palma in the Mercedes and Mulford in the Knox, while the two of them were battling with Bergdoll in the Benz in the free-for-all, which kept

the interest of the spectators at fever heat all through the 305-mile grind. The first day the little Mason driven by Endicott practically had a walkover in the Jencks cup event, for the Herreshoff went out early with a broken wheel, while the little Ford also quit early. In the Aurora the Mason and Falcars promised competition for the three Mercers, but Hughes always had the race at his mercy. One of the Falcars slid into third money, while the other one was among the finishers. In the Illinois the Rayfield went in crippled before the start by a burnt-out bearing. The National looked a contender and would have put up a warm argument had not a break in the magneto coupling eliminated it.

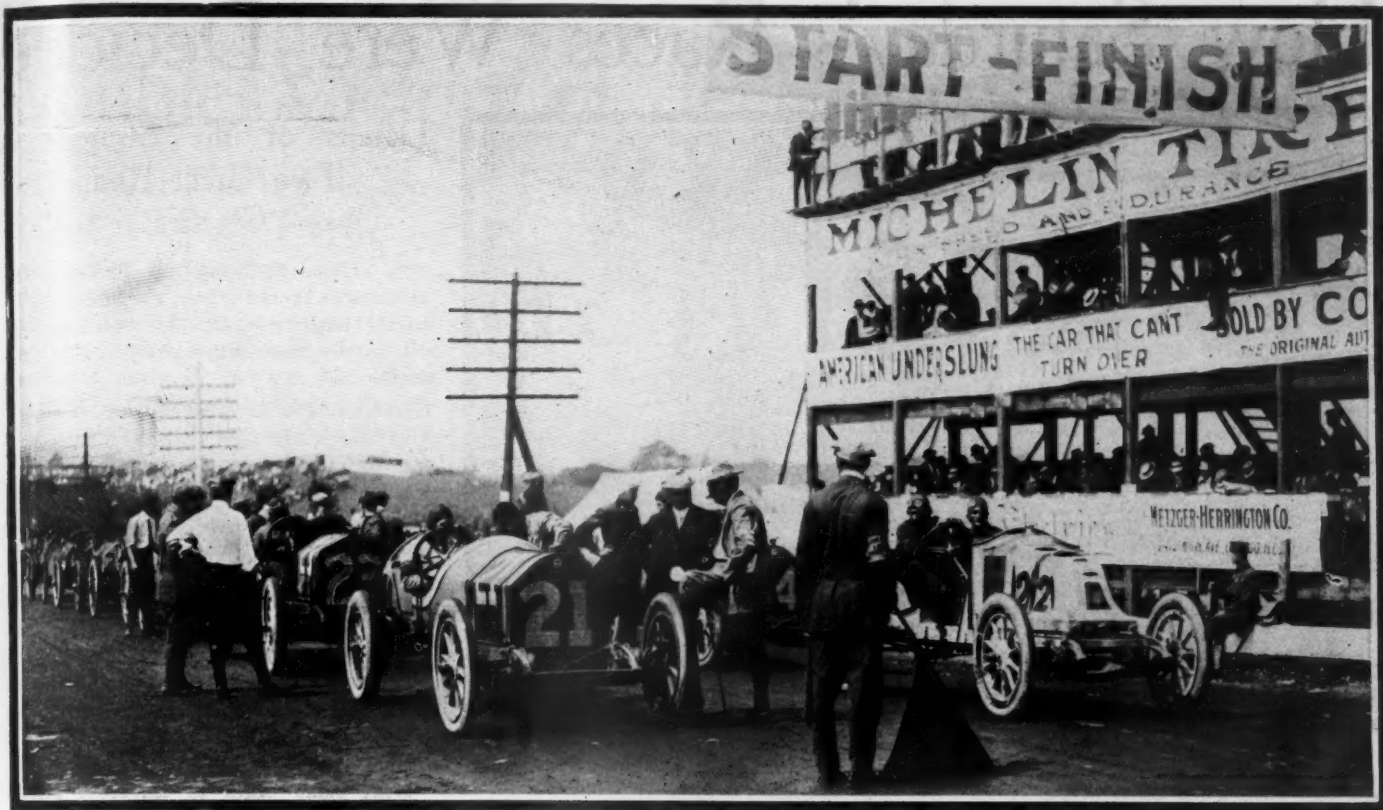
The free-for-all was a remarkable battle in which the star of Bergdoll was in the ascendancy for the most of the distance. The Quaker drove like a demon and it looked as if he would pull down the big end of the purse. He led for the first twenty-two laps, then gave way to de Palma, who led for two rounds, only to yield to Bergdoll's speed. The Benz kept in front to the thirty-fifth lap, when de Palma's persistency, coupled with tire trouble that stopped the Benz, put the Mercedes in front again, which position it held to the end. Mulford in the Knox never was worse than third and in the twenty-sixth and again in the twenty-eighth he was second. In the Elgin trophy race it always was de Palma and Mulford, with the Mercedes driver getting to the front in the fourteenth.

Why de Palma Won

De Palma's victory may be credited up to his careful inspection of his car. Friday in his garage he went over the Mercedes with a drop light and discovered at 4 p. m. that his clutch case was cracked. It was 2 o'clock Saturday morning before he had made the repair and even when he got to the tape he was obliged to do more work. In fact, it was necessary to delay the start of the race 15 minutes in order to give de Palma a chance to get ready. Then the Italian went ahead and won. For the first ten laps his clutch was slipping, then it froze and from that point on de Palma never was able to disengage it. When he stopped at the pits for carburetor trouble he was obliged to kill his motor. Upon starting again he had to watch his chance to go into first, trusting to not stripping his gears and allowing for his rear wheels to slip in the oil. Had he had to make a stop away from the pits, unless he had been favored by a grade, he would have been put out of the race.



ERWIN BERGDOLL IN BENZ, SECOND IN FREE-FOR-ALL AT ELGIN



SCENE AT THE TAPE BEFORE THE START THE FIRST DAY

There was very little excitement at the pits. Little mechanical trouble developed and there were only twenty-five changes of tires on both days. De Palma changed three casings in his races. The work of the pit men was poor and considerable time was lost in making tire changes. The jacks used looked ridiculously small and slow and the Mercer seemed to get the best results.

Twenty-eight Cars Start

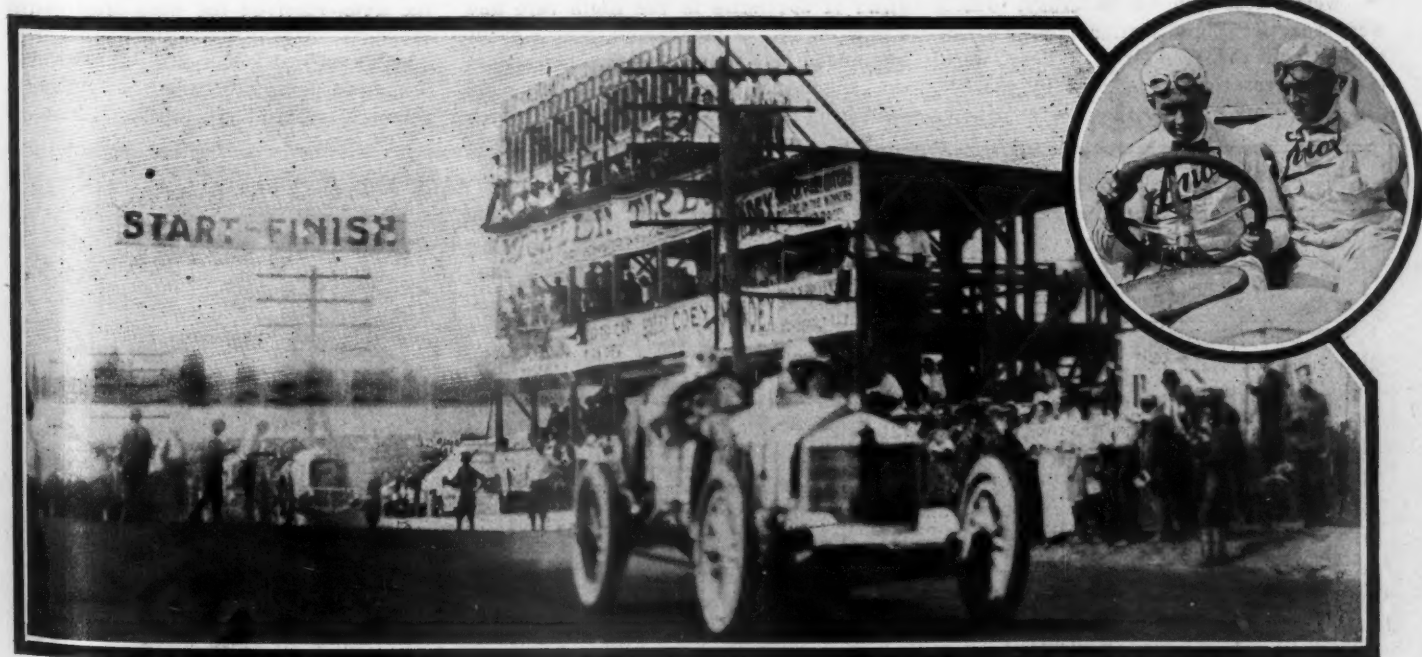
There were thirty-two entries actually on the books on Friday morning. Of this number twenty-eight started in the five

races. The free-for-all had six starters and three finishers; the Elgin had nine starters and three finishers; the Illinois four and two; the Aurora six and five and the Jencks three and one. The scratches were the two Falcars, the National and the big Fiat, all on the second day. The Falcars and National were put out by the first day's racing, while the big Fiat developed differential trouble going to the tape the second day. A deal had been made which had shifted Tetzlaff from the smaller car, Eddie Hearne taking his place. When the big

car went out of commission this left Tetzlaff without a mount and he was forced to sit in the pit. It was thought he might relieve Hearne, who was suffering from a weak wrist but Tetzlaff's contract with the Miller tire people would not permit him to drive Hearne's car which was shod with Michelines.

Big Crowd Out Saturday

As for the attendance, there was a larger crowd on the second day than turned out a year ago, it being estimated that 50,000 lined the course. The first day's crowd was smaller than last year.



RALPH MULFORD IN KNOX SIX, FIRST TO START ON SATURDAY

How Saturday's Races Were Decided



MERZ IN STUTZ, WINNER OF ILLINOIS CUP



H. ENDICOTT IN MASON, WINNER OF JENCKS TROPHY

THE feature races of the Elgin meet were those run on Saturday, which were for the Elgin National Watch Co. trophy and the free-for-all. They were the most sensational ever seen by the Elgin race goers. While there were fifteen

entries, only ten cars lined up for the long grind of 254 miles in the Elgin race and 305 miles in the free-for-all, which event was added this year. The two races were run simultaneously, several of the cars competing in both. The Benz entry, which

Details of the Struggle in Two Great Road Classics

was driven by Bergdoll, Philadelphia's millionaire racing driver, not being eligible in the Elgin race for the reason that its piston displacement was over 600 cubic inches.

Mulford Popular with Crowd

It was easily seen that the crowd liked Mulford. After a delay of 15 minutes, while the pitmen tinkered with de Palma's Mercedes stubborn clutch, Mulford was sent off at 11:15 amid a cloud of smoke. The familiar sight to old followers of the races of the two men cranking the big Knox was repeated before the enthusiastic crowd. Mulford's mechanic was at the crank while he was aided in his efforts by a pit man who pulled on a long leather strap. The big motor took up its work at once.

Next came Clark in Mercedes No. 2. The powerful car jumped into motion at a word from the starter and was after Mulford. Then came the little Mason, winner of the day before in the Jencks trophy event. Following it de Palma in Mercedes No. 4 came to the tape. The on-lookers were in sympathy with him and more than one hoped his ill luck of the past would not deprive him of honors this time. The little Italian determinedly shot his car down the course. Then Eddie Hearne, driving the Fiat which, according to the program, Teddy Tetzlaff was to drive, was sent off. It was doubtful if he would be able to finish the race because of his weak wrist.

Following Anderson's Stutz, Bergdoll in the Benz received the word from Starter Wagner. After what seemed an interminable wait Charlie Merz in the other Stutz was away. This left only the two yellow Mercers at the tape. Wishart was

RESULTS IN ELGIN TROPHY RACE AND FREE-FOR-ALL AS CLOCKED BY WARN

No.	Car	Driver	1 8 miles 2499 feet	2 16 miles 4998 feet	3 24 miles 7497 feet	4 32 miles 10000 feet	5 40 miles 12500 feet	6 48 miles 15000 feet	7 56 miles 17500 feet	8 64 miles 20000 feet	9 72 miles 22500 feet	10 80 miles 25000 feet	11 88 miles 27500 feet	12 96 miles 30000 feet	13 104 miles 32500 feet	14 112 miles 35000 feet	15 120 miles 37500 feet	16 128 miles 40000 feet	17 136 miles 42500 feet	18 144 miles 45000 feet
1	Knox six...	Mulford-Chandler	El. time. 7:15	14:21	21:28	28:03	36:08	43:22	50:41	59:43	66:55	73:55	80:58	87:56	95:00	102:08	112:59	120:14	127:19	134:23
2	Mercedes ...	Clark	Lap time 7:15	7:06	7:07	7:12	7:15	7:14	7:19	9:02	7:12	7:00	7:03	6:58	7:04	7:08	10:51	7:15	7:05	7:03
3	Mason Spl...	Roberts	El. time. 8:03	15:52	23:45	31:41	39:42	47:54	56:09	64:22	72:26	80:28	88:21	96:18	104:02	111:53	119:39	127:26	135:21	143:15
4	Mercedes ...	De Palma	Lap time 8:03	7:49	7:53	7:56	8:01	8:12	8:15	8:13	8:04	8:02	7:53	7:57	7:44	7:51	7:46	7:47	7:33	7:35
5	Fiat 70.....	Hearne-Hill	El. time. 7:08	14:71	21:34	28:45	36:01	43:23	50:41	59:14	66:21	73:32	80:39	87:47	94:55	102:17	110:12	117:33	124:37	131:41
7	Stutz	Anderson	Lap time 7:52	7:09	7:18	7:10	7:14	7:22	7:18	8:33	7:07	7:11	7:01	7:08	7:08	7:22	7:55	7:21	7:04	7:04
8	Benz	Bergdoll	El. time. 7:51	15:38	23:41	31:52	39:07	46:45	54:11	61:27	68:39	75:50	83:07	90:28	97:37	104:51	112:05	119:32	126:55	134:17
12	Stutz	Merz	Lap time 7:09	7:46	7:03	7:51	7:35	7:38	7:26	7:16	7:12	7:11	7:17	7:27	7:09	18:59	7:29	7:27	7:38	8:23
14	Mercer 35...	Wishart	El. time. 8:07	14:04	20:55	27:59	34:57	41:58	49:00	55:58	63:00	70:10	77:11	84:13	91:06	98:11	105:22	112:28	119:36	126:44
15	Mercer 35...	Hughes	Lap time 7:36	7:38	7:32	7:42	7:33	7:34	7:29	7:30	7:34	7:31	7:32	7:31	7:29	7:32	7:25	7:31	7:33	7:37
* In free for all only				14:55	22:13	29:29	36:38	43:43	50:43	57:52	65:00	72:07	79:14	86:21	93:28	100:35	107:42	114:49	121:56	129:03

Double Victory of de Palma's Mercedes

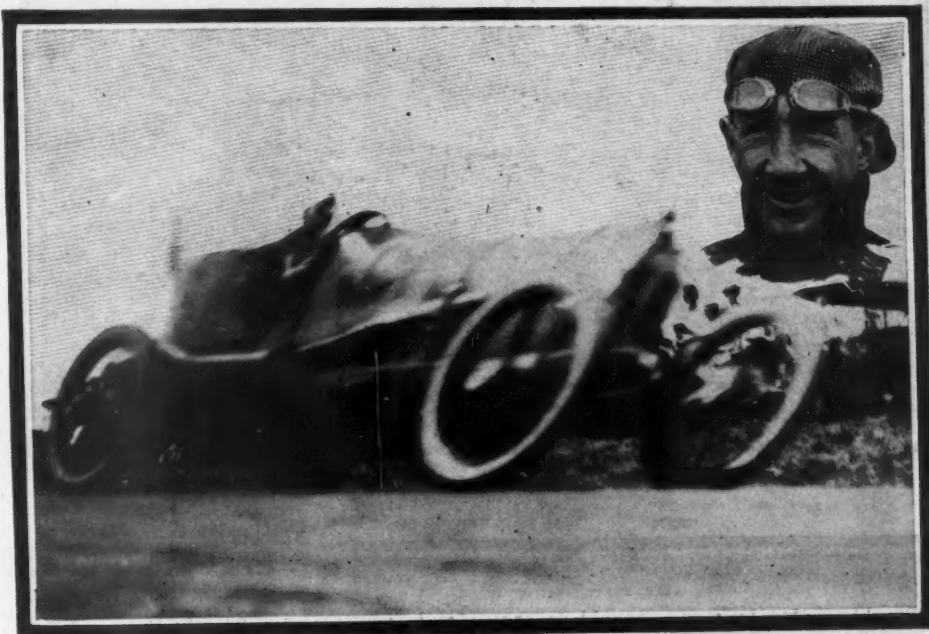
German Car First in Free-for-All and Elgin Trophy Contests

next to go, Hughie Hughes alone remaining. It was not until nearly time for Hughes to come to the line before his attendants cranked his motor and with the good wishes of the crowd he was off after the others.

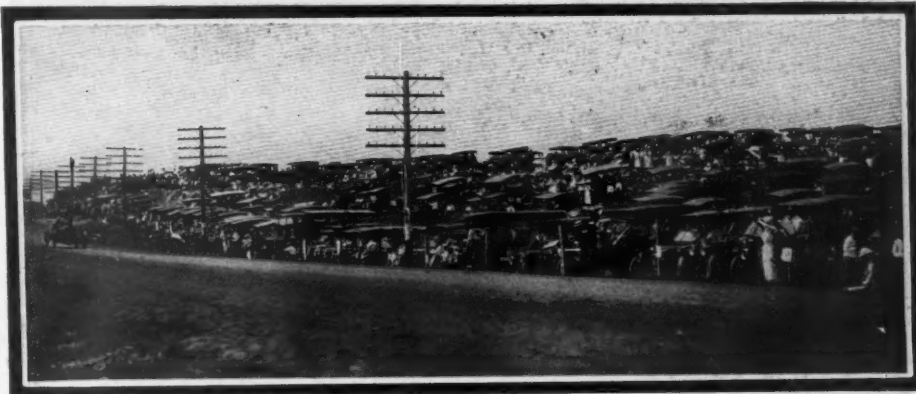
Early Stages of Race

Hardly was Hughes out of sight around the Hornbeek turn when Mulford, running well, hove into sight and had soon completed his first lap. Then came de Palma in his Mercedes, driving like a demon, and having passed Clark in the other Mercedes and Roberts in the Mason in the first lap. He was soon out of sight after Mulford. He had made the circuit in 7:08, 7 seconds faster than Mulford, putting him in first place immediately. This gave Mulford second position, while Hughes was third, Merz fourth, Hearne fifth in the Elgin race, while, considering all the cars, the Benz, which was not entered in the Elgin, was second, with Mulford in the Knox third and Hughes fourth.

Bergdoll was driving at terrific speed and succeeded in coming to first place in the second lap, while de Palma, also getting all the power possible out of his Mercedes, had to be contented with second position. Mulford was in third place. In the third lap Mulford changed positions with de Palma, Bergdoll in the Benz still retaining the lead. This he held from lap No. 2 up through the twenty-second lap, or 186 1/2 miles of his long grind of 305 miles. In this lap he was obliged to stop on the back stretch on account of tire trouble. This delay gave de Palma the lead which he maintained in the twenty-third and twenty-fourth laps. He would, no doubt, have led Bergdoll longer had he not been obliged to stop at the pit at



HUGHES IN MERCER, WINNER OF AURORA TROPHY



CARS PARKED ON BRITTEN'S HILL IN HOMESTRETCH

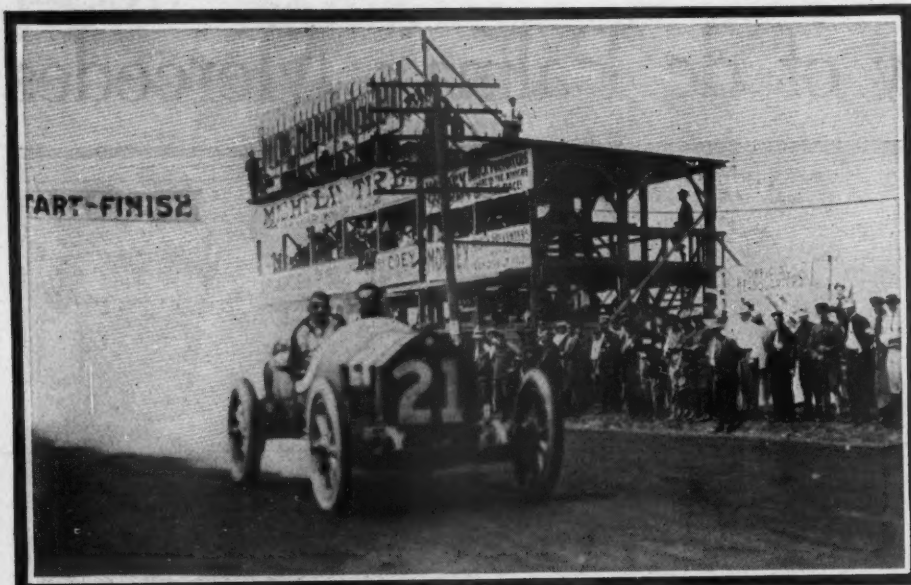
the end of the twenty-fourth lap to take on gasoline and oil and to replace his left rear tire. This wait put Bergdoll again in the lead, which he retained for ten of the remaining twelve laps of the free-for-all race. De Palma was now in second place,

while in the same lap Mulford was a close third, which position he had held since the fifteenth lap, or 127 miles, had been passed. He was pressing de Palma closely and in the twenty-sixth lap succeeded in regaining second position, about

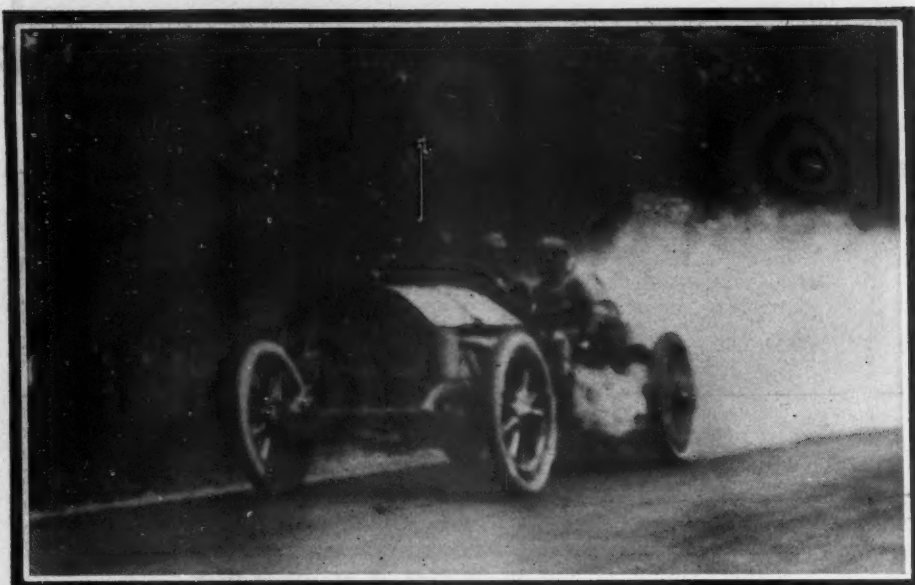
ELECTRICAL TIMING DEVICE, SHOWING TIMES FOR ALL THE LAPS

Lap	100 miles 624 feet	200 miles 1248 feet	210 miles 1312 feet	220 miles 1376 feet	230 miles 1440 feet	240 miles 1504 feet	250 miles 1568 feet	260 miles 1632 feet	270 miles 1696 feet	280 miles 1760 feet	290 miles 1824 feet	300 miles 1888 feet	Position at finish	Miles per hour	31 262 miles 1640 feet	32 271 miles 1688 feet	33 279 miles 1736 feet	34 288 miles 1784 feet	35 296 miles 1832 feet	36 305 miles 1880 feet	Position at finish	Miles per hour	
146:32 8:04	150:32 7:00	157:29 6:57	164:28 6:59	171:31 7:03	178:39 7:08	185:46 7:07	192:56 7:10	200:03 7:07	206:57 6:54	217:30 10:33	226:09 8:39		2	67.4	233:28 7:19	241:01 7:35	249:29 8:28	258:22 8:53	266:14 7:52	274:08 7:54	72	3	66.6
123:20 7:47	160:08 7:48	167:58 7:50	175:42 7:44	183:30 7:48	191:16 7:46	199:07 7:48	206:58 7:51	214:50 7:52	222:40 7:50	230:30 7:50	238:17 7:47		4	63.8									
128:31 8:57	145:32 7:01	152:36 7:07	159:37 7:01	166:43 7:06	174:01 7:18	183:46 9:45	190:59 7:13	198:38 7:39	207:33 8:45	214:57 7:24	223:20 8:23		1	68.4	230:23 7:03	237:39 7:16	244:53 7:04	251:51 6:58	258:47 6:56	265:36 6:49	25	1	68.9
134:36 7:47	162:23 7:47	169:59 7:36	177:47 7:48	185:24 7:37	193:08 7:44	200:48 7:40	212:27 7:39	Out—broken gearset housing															
144:36 7:39	153:29 8:43	161:08 7:39	169:32 8:24	178:26 8:54	186:55 8:29	199:24 12:29	209:46 10:22	217:14 7:28	224:48 7:34	232:24 7:36	239:57 7:33		5	63.3									
138:54 7:03	144:14 10:20	151:19 7:05	158:45 7:26	168:40 9:55	176:00 7:20	183:14 7:14	190:22 7:08	197:32 7:10	204:44 7:12	211:52 7:08	219:04 7:12				226:25 7:21	233:45 7:20	243:19 9:34	250:57 7:38	259:26 8:29	270:28 11:02	28	2	67.5
142:29 7:37	160:08 7:39	167:49 7:41	175:36 7:47	183:17 7:41	190:58 7:41	198:30 7:32	206:15 7:45	214:00 7:45	221:34 7:34	229:16 7:42	236:43 7:27		3	64.2									
Out—broken oil lead and water pump																							

Out—Burnt-out connecting rod bearings



GIL ANDERSON IN STUTZ, SECOND IN ILLINOIS CUP



TRUSSEL IN FALCAR, THIRD IN AURORA CUP RACE



PULLEN IN MERCER, SECOND IN AURORA CUP RACE

2 minutes behind Bergdoll in the Benz, while de Palma was less than a minute more than he. The twenty-ninth lap saw tire trouble for both Mulford and de Palma. The latter stopped at the pit after completing this lap and to him the short wait seemed endless. He was all eagerness to be away. But before he was off again Mulford also stopped at his pit for identically the same reason.

De Palma Grasps an Opportunity

Immediately de Palma saw his chance. He pressed his attendants to their utmost, and was away again, fairly lifting his machine from the ground in getting off. There was only a single lap remaining to the Elgin race and de Palma realized it fully. He retained his advantage, for the first time in his career crossing the tape the winner of a big road race. But he did not slacken his speed, for he had still six laps to go before finishing the free-for-all race in which he was also entered. Mulford was next to finish.

Meanwhile the other cars were changing their positions somewhat. After completing three laps Hearne was obliged to quit the Fiat No. 5 because of his wrist becoming too weak to properly control the car and George Hill, mechanic for Tetzlaff, took his place in the big red car. Hill lost no time in getting the Fiat under way again and drove daringly and with the nerve of a veteran for twenty-three laps. When Hill took the wheel he was in sixth place, but in the sixth lap Clark's Mercedes, which had been in fifth position, was put out of the race by accident, giving this position to Hill in the Fiat. In the eighth lap Hill took the fourth position in the Elgin, which had been held by Merz in the Stutz. Two laps later he took third position from Anderson in the other Stutz and retained it through the thirteenth, when he dropped to seventh place, Merz regaining his former place in the van. Trouble with the transmission was rapidly taking on serious proportions, judging by the noise emanating from Hill's machine, and after completing twenty-six laps he was obliged to drop out of the race on this account. He was then in sixth place.

Clark Meets with Mishap

The first car to drop out was the Mercedes driven by Clark, which after being in fifth place on the fifth lap, was preparing to negotiate the Hornbeek turn, the first after passing the pits, was driven into the straw banking of the turn and damaged sufficiently to put it out of the race. Clark miscalculated the turn, ran into a small concrete culvert located at this point, with sufficient force to blow up one of his tires. This sent his car swerving to the right and into a fence, breaking both rear wheels and pitching him and his mechanic over the fence. Neither was seriously hurt, each being only slightly bruised. Had it not been for the straw bales banking the turn the accident undoubtedly would have been serious. Cur-

ously enough, Clark had objected previously to the use of the straw for this purpose.

As a safety element these straw bales at the four turns demonstrated their worth. Not only did they save Clark and his mechanic, but they prevented injury to Wishart, whose Mercer got off the course at one turn, and to Wordingham, who also ran into them, ditching his Herreshoff car and breaking one of its wheels without injury to himself or his companion.

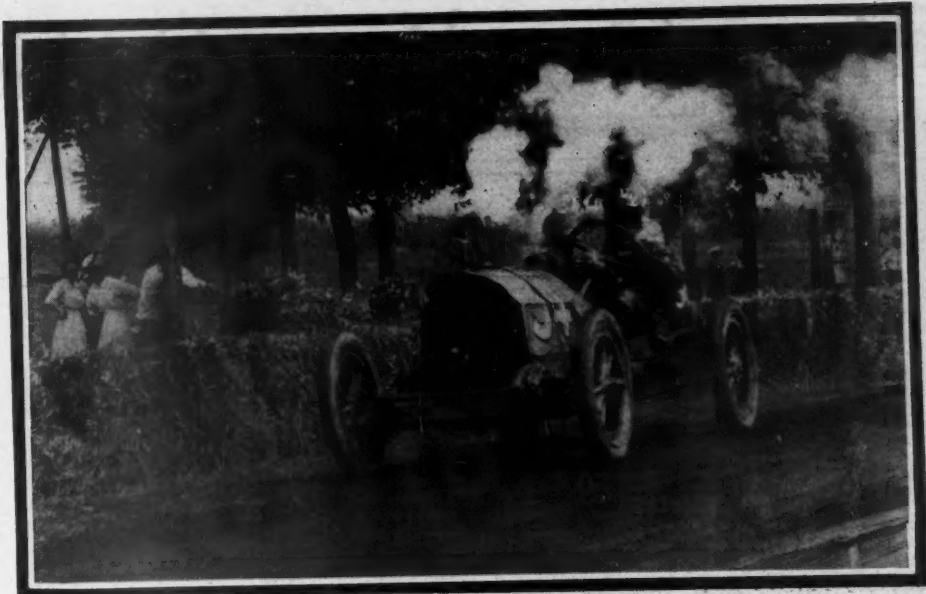
Stutz Next to Finish

Following Mulford, Merz in Stutz No. 12 was next to finish in the Elgin race. He came into this position due to the accident to Wishart's car in the twenty-fifth lap when he broke his oil lead and water pump, and to Hughes' Mercer, which was running well up to the eighteenth lap, when a burnt-out crankshaft bearing rendered it useless as a contender for the honors.

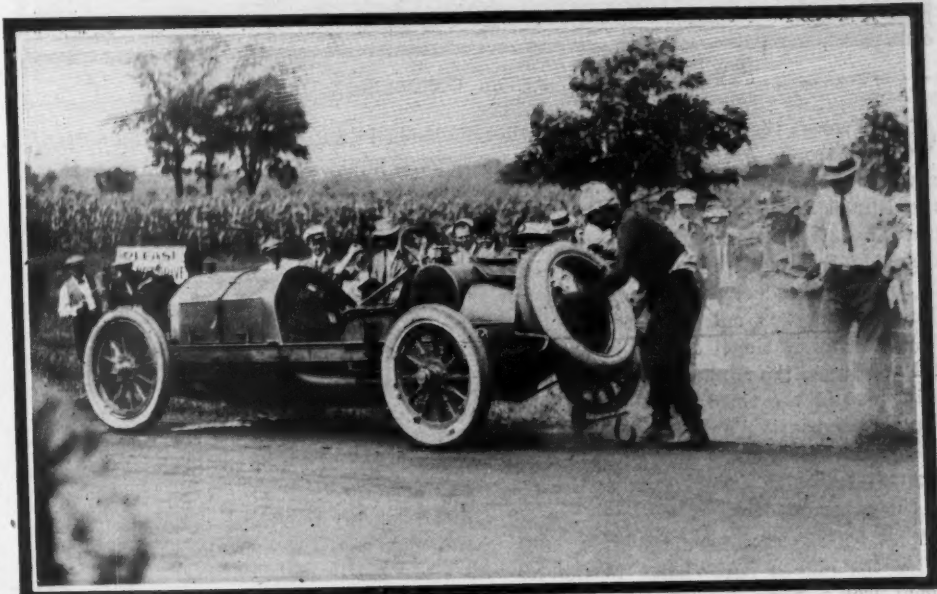
These various accidents left only three cars to contend for the free-for-all honors. These were Bergdoll's Benz, de Palma's Mercedes and Mulford's Knox. The performance of these three cars was the most sensational of the 2 days' meet. Bergdoll was in the lead at the beginning of the thirty-first lap, with de Palma a close second and Mulford trailing him. The Benz, except for three laps, the first, the twenty-third and the twenty-fourth, had been the leading car so far throughout the entire distance of 203 miles. It looked as if the three would finish in the order named above. Each was maintaining terrific speed and no change in their relative positions took place until the thirty-fifth, or next to the last, lap.

Bergdoll was about a minute in the lead of de Palma when on the back stretch he was forced to stop for a tire change. This gave de Palma an opportunity for the second time that day, and in the thirty-fifth lap he passed the Benz while it was still making the tire change. There was no stopping him now and Bergdoll was obliged to cross the tape second to the Italian, after practically leading the field from the start of the 305-mile run. This misfortune of Bergdoll's when victory was almost his recalls de Palma's ill-luck at Indianapolis when he was obliged to succumb to engine trouble and to give the race to Joe Dawson when he had led for 496 of the 500 miles.

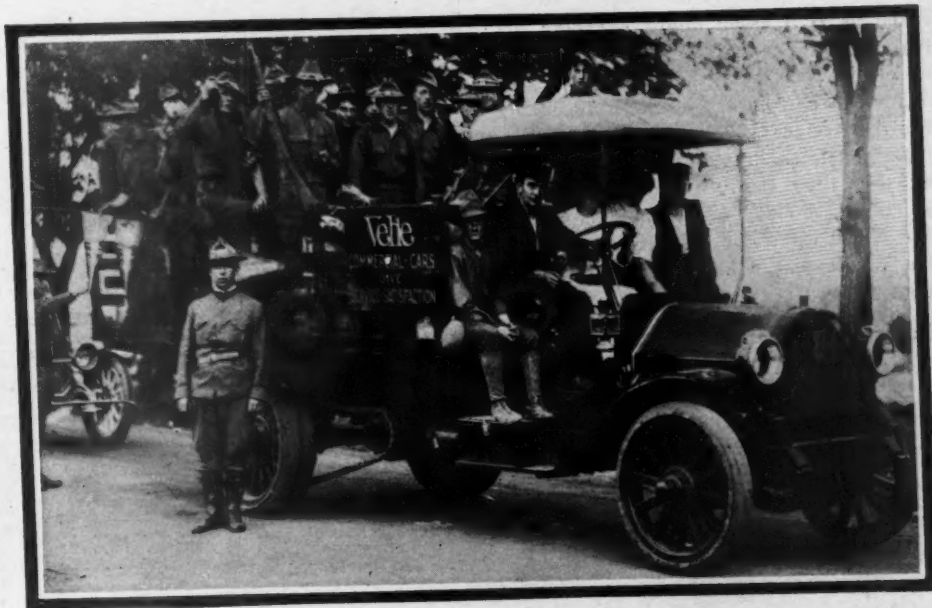
Mulford did not finish his race. On the thirty-third lap, when nearing the grand stand he was overcome by the intense heat and nearly lost control of the speeding Knox. His mechanic leaned over and guided the big car to the pit. Mulford was lifted from the car and assisted to the hospital tent, while his mechanic, William Chandler, jumped into the driver's seat and one of the pit attendants got in beside him and the Knox was sent away again.



MORT ROBERTS IN MASON, FOURTH IN ELGIN TROPHY RACE

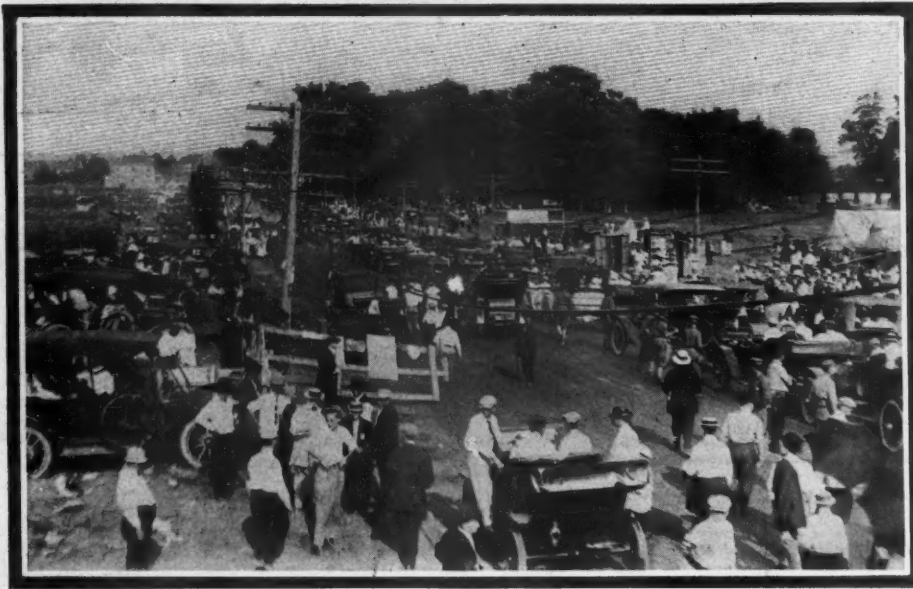


WISHART CHANGES TWO TIRES ON HORNBECK TURN



SOLDIERS GOING TO THEIR POSTS IN VELIE TRUCK

Three Class Races Decided on Friday



CARS ON COURSE AFTER CONCLUSION OF RACES

ON Friday, the Jencks, Aurora and Illinois trophy events were run simultaneously. Merz in the Stutz was winner of the Illinois trophy event, while his teammate Anderson, also in a Stutz, was a good second. These two cars were the only ones to finish the race, which was of twenty-four laps, or 203 miles, 1,896 feet. The Rayfield and National entries in this race did not finish, the former driven by Hobbs being out in the third lap with a broken crankshaft bearing and the National, piloted by Whalen, being obliged to quit the race after nine laps on account of a break in the magneto drive.

Merz led the race from the start, while up to the eighth lap Whalen in the National was a close second, cutting down the former's lead with each lap up to the fifth. In completing the fourth lap it looked as if Whalen might overtake his rival, so quickly had he gained. At the end of the fourth lap the time of the two leaders was as follows: Merz, Stutz, 30:20; Whalen, National, 30:44.

Merz made this fourth lap in just 1 second less time than Whalen, completing the circuit in 7:34. In the next lap, however, Merz made the fastest time of his race and increased his lead over the National by 9 seconds.

Whalen retained second place up to the eighth lap, while the other Stutz—driven by Anderson—was fast gaining on him. It was at the completion of his eighth lap that the latter succeeded in nosing out the National for second place. Whalen completed another lap, and was on his tenth circuit when misfortune overtook him and put his car out of the race. The magneto coupling broke and this stopped the National.

Whalen's dropping out left the race entirely in the hands of the Stutz cars, which had a merry time of it together from the ninth lap to the finish. Both cars continued to perform consistently to the end.

Endicott, Hughes and Merz Winners on First Day

FASTEST LAPS FOR ALL DRIVERS Free-for-All

Car No.	Car	Lap	Lap Time	Speed
1	Knox six	28	6:54	73.6
2	Mercedes	4	7:21	69.1
4	Mercedes	36	6:49	74.5
5	Fiat	13	7:09	71.0
8	Benz	3	6:51	74.1
15	Mercer	4	7:11	70.7

Elgin Trophy

Car No.	Car	Lap	Lap Time	Speed
1	Knox six	28	6:54	73.6
2	Mercedes	4	7:21	69.1
3	Mason Spec. 13 & 22	15	6:55	73.4
4	Mercedes	15	6:55	73.4
5	Fiat	13	7:09	71.0
7	Stutz	15	7:25	68.5
12	Stutz	30	7:27	68.2
14	Mercer	8	7:32	67.4
15	Mercer	4	7:11	70.7

Illinois Trophy

Car No.	Car	Lap	Lap Time	Speed
21	Stutz	9 & 21	7:36	66.8
22	Rayfield	1	8:35	59.1
23	National	3 & 6	7:41	66.1
24	Stutz	5	7:28	68.0

Aurora Trophy

Car No.	Car	Lap	Lap Time	Speed
31	Mercer	10	7:50	64.8
32	Falcar	9	7:22	69.0
33	Falcar	7 & 15	9:03	56.2
34	Mason	11	7:58	63.7
35	Mercer	5, 8 & 9	7:39	66.4
36	Mercer	17	7:23	68.8

Jencks Trophy

Car No.	Car	Lap	Lap Time	Speed
41	Mason Special	3	7:51	64.7
42	Ford	5	11:52	42.9
43	Herreshoff	1	10:49	47.0

Merz maintained his lead over Anderson practically as at the tenth lap. In his twelfth lap, however, Merz lost 50 seconds when he was obliged to stop at his pit for gasoline and oil. He was off again with a lead of but 8 seconds for the twelfth lap over his rival, Anderson. The latter took advantage of this opportunity

RESULTS IN AURORA TROPHY RACE FOR 231-300 CLASS,

No.	Car	Driver	Elapsed time	1 8 miles 2499 feet	2 16 miles 4998 feet	3 25 miles 7217 feet	4 33 miles 9716 feet	5 42 miles 12515 feet	6 50 miles 15314 feet	7 59 miles 18113 feet	8 67 miles 20912 feet
31	Mercer	Pullen	Elapsed time...	8:21	16:15	24:11	32:07	40:05	48:01	56:06	64:30
			Lap time...	8:21	7:54	7:56	7:58	7:58	7:56	8:05	8:24
32	Falcar	Hastings	Elapsed time...	10:15	20:30	30:48	40:36	50:47	60:57	70:55	83:16
			Lap time...	10:15	10:15	10:18	9:48	10:11	10:10	9:58	12:21
33	Falcar	Trussel	Elapsed time...	9:28	22:57	32:05	41:13	50:44	60:04	69:07	78:17
			Lap time...	9:28	13:29	9:08	9:08	9:31	9:20	9:03	9:10
34	Mason	Roberts	Elapsed time...	8:36	23:10	31:18	39:26	47:41	55:56	64:41	72:40
			Lap time...	8:36	14:34	8:08	8:08	8:15	8:15	8:45	7:59
35	Mercer	Wishart	Elapsed time...	8:04	15:45	23:30	32:01	40:40	49:23	57:43	66:07
			Lap time...	8:04	7:41	7:45	18:31	7:39	7:43	7:44	7:39
36	Mercer	Hughes	Elapsed time...	7:52	15:26	22:53	30:32	38:33	46:20	54:22	62:17
			Lap time...	7:52	7:34	7:27	7:39	8:01	7:47	8:02	7:55

RESULTS IN THE ILLINOIS TROPHY RACE FOR 301-450 CLASS,

No.	Car	Driver	Elapsed time	1 8 miles 2499 feet	2 16 miles 4998 feet	3 25 miles 7217 feet	4 33 miles 9716 feet	5 42 miles 12515 feet	6 50 miles 15314 feet	7 59 miles 18113 feet
21	Stutz	G. Anderson	Elapsed time...	8:00	15:49	23:30	31:15	38:54	46:34	54:12
			Lap time...	8:00	7:49	7:41	7:45	7:39	7:40	7:38
22	Rayfield	W. Hobbs	Elapsed time...	8:35	34:32	Out—burned out crankshaft bearing				
			Lap time...	8:35	25:57					
23	National	N. Whalen	Elapsed time...	7:46	15:28	23:09	30:44	38:21	46:02	53:45
			Lap time...	7:46	7:42	7:41	7:35	7:37	7:41	7:43
24	Stutz	C. Merz	Elapsed time...	7:44	15:16	22:46	30:20	37:48	45:18	52:51
			Lap time...	7:44	7:32	7:30	7:34	7:28	7:30	7:33

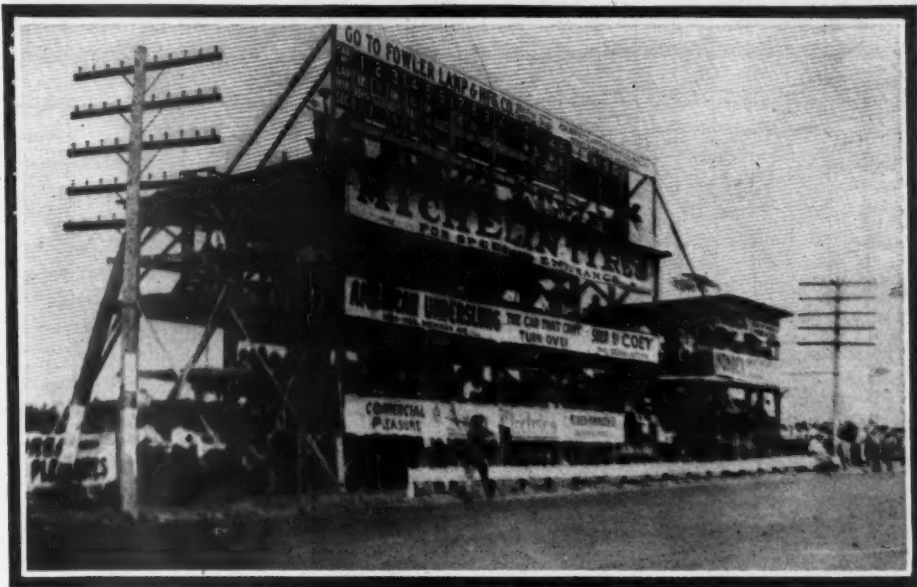
Details of Curtain-Raising Contests

How the Mason, Mercer and Stutz Landed the Trophies

to cut down the breach between himself and Merz and on completing the next lap, the leader maintained his position by a margin of only 2 seconds.

In the following lap, however, Anderson was compelled to stop at the pit to take on gasoline and oil, losing 30 seconds by this, giving Merz a lead of 1 minute 4 seconds for the fourteenth lap. From this time on until the end of the race, the two cars stayed about the same distance apart.

The two pit stops for lubricant and fuel were the only ones made during the entire race, no tire trouble being met with by the two cars, a rather remarkable performance.



VIEW OF OFFICIAL STANDS ON INSIDE OF COURSE

RESULTS IN JENCKS TROPHY RACE FOR 230 AND UNDER CLASS, NON-STOCK, WON BY MASON

No.	Car	Driver	1 8 miles 2499 feet	2 16 miles 4998 feet	3 25 miles 2217 feet	4 33 miles 4716 feet	5 42 miles 1935 feet	6 50 miles 4434 feet	7 59 miles 1653 feet	8 67 miles 4152 feet	9 76 miles 1371 feet	10 84 miles 3870 feet	11 93 miles 1089 feet	12 101 miles 3588 feet	Position at finish	Miles per hour
41	Mason Special	Endicott	Elapsed time. 8:05	16:07	23:58	32:13	40:42	49:18	57:59	66:28	79:51	83:24	92:11	100:42:9	1	60.57
42	Ford 1911	Henning	Lap time. 8:05	8:02	7:51	8:15	8:29	8:36	8:41	8:29	8:23	8:33	8:47	8:31	2	
43	Herreshoff 20	Wordingham	Elapsed time. 12:15	29:46	41:40	54:21	66:13	67:28	Out—ditched						3	
			Lap time. 12:15	17:31	11:54	12:41	11:52	21:15								
			Elapsed time. 10:49		Out—broken wheel											
			Lap time. 10:49													

Six cars, contenders in the Aurora trophy race for cars of from 201 to 300 cubic inches piston displacement, were the next to be sent off by Starter Fred J. Wagner amid a cloud of smoke and in order ac-

cording to their entry numbers. Hughie Hughes in his Mercer, although the last to start, jumped into the lead on the first lap and retained that position throughout the entire race of 152 miles. His time for

the initial lap was 7:52, one of the slowest of his race. His team mate, Spencer Wishart, was in second position for three laps, in the fourth lap giving up this position to Pullen in another Mercer. The latter did not lose this position throughout the rest of the race, crossing the tape second to Hughes.

Jencks Trophy Race

The Jencks trophy event went to Mason entry No. 41, which was driven by Endicott at an average speed of 60.7 miles an hour. He had practically no opposition throughout the entire race and was the only one of the three starters to complete the run of 101 miles 3,588 feet, or twelve laps. His total time was 100 minutes 42.9 seconds. The other two entries were Ford and the veteran Herreshoff driven by Wordingham.

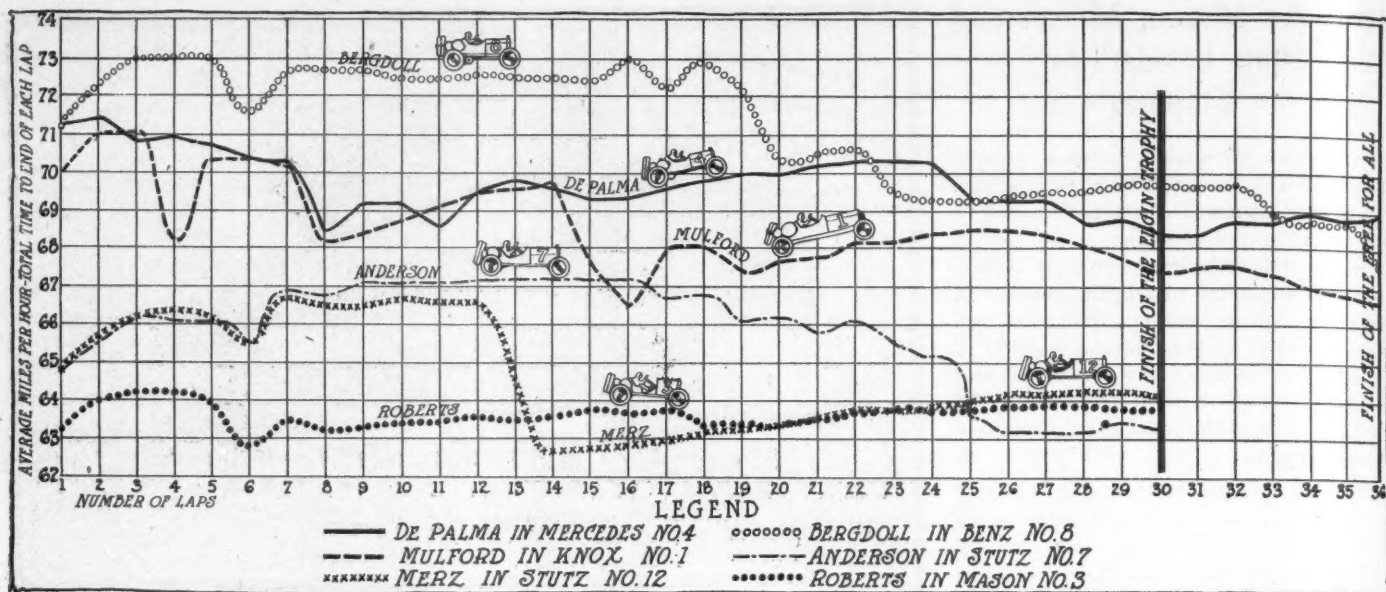
NON-STOCK, WON BY HUGHIE HUGHES IN MERCER

9 76 miles 1371 feet	10 84 miles 3870 feet	11 93 miles 1089 feet	12 101 miles 3588 feet	13 110 miles 807 feet	14 118 miles 3306 feet	15 127 miles 525 feet	16 135 miles 3024 feet	17 144 miles 243 feet	18 152 miles 2742 feet	Position at finish	Miles per hour
72:58	80:28	90:28	98:25	106:21	114:21	122:09	130:15	138:26	146:31:45	2	62.3
8:08	7:50	10:00	7:57	7:56	8:00	7:48	8:06	8:11	8:05		
90:38	105:19	115:13	125:04	134:57	144:51	154:33	164:34	174:20	183:57:53	5	49.9
7:22	14:41	9:54	9:51	9:53	9:54	9:52	9:51	9:54	9:37:53		
87:28	96:44	105:55	115:05	124:09	133:15	142:18	151:16	160:14	169:19:3	3	54.06
9:11	9:16	9:11	9:10	9:04	9:06	9:03	8:58	8:58	9:05		
80:41	88:47	96:45	104:45	113:58	123:53	141:12	153:50	167:23	178:11:74	4	51.4
8:01	8:06	7:58	8:00	9:13	14:55	12:19	12:38	13:33	10:48		
80:25	96:00	106:37	114:26	122:17	Carburetor caught fire Burned wiring.						
7:39	15:35	10:37	7:49	7:51	110:10	117:57	125:42	133:01	140:40:11	1	65.0
70:09	77:58	86:24	94:31	102:28	7:42	7:41	7:45	7:23	7:35		
7:52	7:49	8:26	8:07	7:57							

NON-STOCK, RUN ON FRIDAY AND WON BY MERZ IN A STUTZ

8 67 miles 4152 feet	9 76 miles 1371 feet	10 84 miles 3870 feet	11 93 miles 1089 feet	12 101 miles 3588 feet	13 110 miles 807 feet	14 118 miles 3306 feet	15 127 miles 525 feet	16 135 miles 3024 feet	17 144 miles 243 feet	18 152 miles 2742 feet	19 160 miles 5241 feet	20 168 miles 2460 feet	21 177 miles 4959 feet	22 186 miles 2178 feet	23 194 miles 4677 feet	24 203 miles 1896 feet	Position at finish	Miles per hour
61:49	69:25	76:56	84:33	92:08	99:48	108:27	116:26	124:22	132:11	140:02	147:47	155:36	163:12	170:56	178:37	186:14:15	2	65.6
7:37	7:36	7:31	7:34	7:35	7:40	8:39	7:59	7:56	7:49	7:51	7:45	7:49	7:36	7:44	7:41	7:37		
61:56	72:06	Out—Magneto drive trouble																
8:11	10:10																	
60:27	68:02	75:38	83:13	92:00	99:46	107:22	114:59	122:78	130:23	138:11	146:00	153:40	161:22	169:12	176:49	184:32:25	1	66.11
7:36	7:35	7:36	7:35	8:47	7:46	7:36	7:37	7:39	7:45	7:48	7:49	7:40	7:42	7:50	7:37	7:43		

Elgin Races as Viewed from the Pits



RELATIVE POSITIONS OF THE CARS FINISHING IN THE ELGIN TROPHY AND FREE-FOR-ALL

The average speed made by each car for the distance from the start to the end of each lap is shown, as well as the relative positions of the contestants. Notice the neck-and-neck race between Roberts and Merz, with Merz finally creeping ahead.

FREEDOM from tire trouble was one of the characteristics that again distinguished this year's races at Elgin. There were in all, only twenty-five cases of tire trouble in the whole 2 days of racing, three of these being responsible indirectly for putting cars out of the race. Only two stops at the pits were made in the first day's events on account of tire trouble and these were both in the Aurora trophy race. Neither in the small-car race or the Illinois trophy event were stops necessitated in the cars that finished.

Few Tire Replacements

In the Elgin trophy and the free-for-all sixteen tire replacements were made at the pits; ten of these were made on the right rear wheels, four on left rear wheels and one on a front wheel. One other tire stop was occasioned by the replacement of a new spare at the pits for one that had been taken off at another point on the course.

Seven stops were made to refill oil, gasoline and water tanks in the second day of racing, one for carburetor adjustment, and two to change drivers. Carburetor adjustment occasioned one stop on the first day, as did the necessity for tightening up shock absorbers. Two stops were made to refill fuel, oil and water tanks on the first day, both in the Illinois trophy event.

There were six stops made during Friday's racing, and the total number of stops on the following day was twenty. Very often advantage was taken of the enforced halt for tire changes to replace depleted supplies of fuel, water and lubricant.

On the whole, the work at the pits showed lack of training and preparation

by the attendants. Too much time was taken in tire changes, jacks were too small at the base and were too slow. One man wasted 2 valuable minutes endeavoring to force a tire on the rim with the brace wrench wedged between it and the roadbed. The Stutz, Mercer and Fiat pits seemed to be the best organized. The quick-acting jacks used at the Mercer pit facilitated rapid tire changes. The demountable wheels on Hughes' Mercer also made changes quick, although it is not proven by these races that the use of wire spokes makes tire changes necessary any less frequently. Hughes made two changes during his 144 miles of running. From the track, however, it looked as though Hughes' car held to the road better than did any of the others, possibly because the vibration due to roughness of the road surface was taken up by the wire spokes instead of being transmitted to the springs.

Friday's small-car race for the Jenek's trophy was unique in one respect, and that during the whole of the 96 miles of the race none of the three cars stopped at the pits, either for tires, or mechanical work on the car for replacement of gasoline, fuel or oil.

Henning's Ford ran a slow but conservative race for the first 50 miles, when it was ditched and out of the contest. Although the Ford was running but little better than half as fast as the Mason, it only needed to keep going for the total distance to make second place as the only other starter, the Herreshoff, was out. Hennings' mount was a veteran and was beginning to loosen up badly, particularly the radiator. One side of the radiator

panel had loosened and was threatening to fall off at any moment.

This car came near being ruled off before the start. The exhaust manifold had been taken off and no arrangements had been made to lead the exhaust gases outside the hood. F. E. Edwards, chairman of the technical committee, refused to let the car start when it lined up until the lower half of the bonnet was removed to allow the motor to exhaust directly to the air.

The Mason, driven by Endicott, ran a consistent race without a stop and finished alone.

Stops in Aurora Trophy

Of the six contestants for the Aurora trophy, only three cars stopped at the pits during the 152 miles of the race and one of these was entirely unnecessary. The latter was when Hughes, in the Mercer, stopped in his twelfth lap to inform the pit attendants that his teammate, Pullen, in the Mercer No. 31 had blown a tire on the back stretch. After thus relieving the minds of the pitmen on this score, Hughes resumed his place in the lead without further stops.

The first stop of the day for anyone was at noon, when Roberts in the Mason halted for 45 seconds to tighten up a shock absorber which had worked loose. Fifty minutes later Wishart's Mercer stopped to change a left rear tire and take on two spares, which had been used in tire changes at other points on the course.

One minute 55 seconds was consumed at the pit. The only other stop in this race was when Wishart's Mercer stopped again for 2 minutes and 30 seconds to adjust the

a right rear tire. In the fourteenth lap carbureter. The only car which seemed to have suffered from tire trouble at all during this race were the two Mercers driven by Pullen and Wishart. Pullen's only stop was on the back stretch as he did not stop to replace his spare at the pit.

In the Illinois trophy race, although the longest of Friday's racing, was freer from pit work than was the Aurora trophy. There were only two stops at the pits recorded, these were the two Stutzes, the only cars to finish. The first stop of this race was Merz's Stutz which stopped for gasoline and oil after the first 100 miles. Fifty seconds was consumed filling the tanks. Fifteen minutes later the other Stutz, driven by Anderson, halted to refill its tanks and was away again in less than ½ minute. This race was singularly free from tire troubles, considering the fact that it was over 200 miles at an average of better than 60 miles an hour. No stops were made at the pit for tire changes and no spares were taken on. The only mechanical difficulty in the Illinois trophy race occurred to the Rayfield and National entries, the former going out in the third lap on account of a broken connecting rod bearing, while the latter was put out by trouble with the magneto drive.

Elgin National and Free-For-All

Saturday's racing was more prolific in pit work than that of the day before. This was to be expected as it was not only longer distance but there were more cars entered and bigger cars, the high speed burning up the tires and requiring frequent replacements of gasoline and oil. It was necessary, as well, to relieve the drivers before the end of the 250 miles in two instances. The first stop of the day was for the latter purpose when Hearne, who was piloting the No. 5 Fiat, stopped at the end of his third lap to be replaced at the wheel by George Hill. It was 15 seconds after pulling up at the pit that Hill had the machine in action again. Hill stopped in the fourteenth lap to take on

gasoline, oil and water and a spare tire which detained him for 1 minute and 45 seconds. His last stop was at the end of the twenty-seventh lap when the car limped in with a broken gearset housing and notified the starter that it was out of the race for good.

Hughie Hughes in the Mercer halted at the pit to take on a spare wheel in the record time of 15 seconds, a right rear wheel had been replaced on the course. This stop was in the sixth lap. His only other stop was in the fifteen lap, when he took on gas, oil and water, and changed a right rear wheel, and was on his way again in 45 seconds. Hughes was the only driver to employ demountable wheels.

After running approximately 150 miles Hughes had to pull in and withdraw from the race on account of a burned out connecting rod bearing. De Palma's first stop was in his seventh lap when he changed a right rear tire, requiring 2 minutes 30 seconds. He ran for 150 miles without further stop till in the twenty-fourth lap he was held for 1 minute 36 seconds to refill the oil, fuel and water tanks and change the left rear tire. A right rear tire was changed in the twenty-ninth lap and the carbureter adjusted, at which time he was halted for 1 minute 15 seconds.

Bergdoll in the Benz made only two stops at the pit. He had run 186 miles without a stop of any description but in the twenty-second lap had to replace a tire on the back stretch halting at the pits for an extra tire and to take on gas, oil and water. Up to this time Bergdoll was the leader in the free-for-all but his stop of 2 minutes 15 seconds cost him the lead for a time. His only other stop was in the last lap, at which time a right rear tire was changed and some difficulty was found in replacing it. The time consumed, which was nearly 3 minutes, was sufficient to cost him first place in the free-for-all.

Mulford had run only 60 miles when he made his initial halt at the pits to change both rear tires were changed. His next

stop was in the next to the last lap of the Elgin race when a right rear tire was again replaced, 1 minute 22 seconds being consumed in the operation. At the end of the thirty-third lap the Knox came into the pit with Mulford exhausted and his mechanic, Chandler replaced him. The Mercedes, driven by Clark, made no stop during the 45 miles of running, but went out in the sixth lap when it ran into the fence and broke both rear wheels at Hornbeek's turn. Roberts in his Mason special ran 144 miles before making his first stop, at which time he was halted for 1 minute to refill his fuel and oil tank and his radiator. This was his only stop in the Elgin trophy race and he encountered no tire trouble whatever, the only one to finish the race without tire trouble.

Two Stops in Succession

The two Stutz cars were comparatively free from troubles which required pit work. Merz's car made two stops in succession in the fourteenth and fifteenth lap, the last of these was for an extra tire but he was away again in 30 seconds and the first was for gas and oil and a right rear tire replacement, requiring 3 minutes time. With the exception of these two stops, Merz ran without a halt. Anderson likewise stopped twice at the pits, once in the sixteenth lap for 1 minute for oil and fuel and again in the twentieth lap to change the left rear tire. This held him at the pits for 1 minute and 23 seconds.

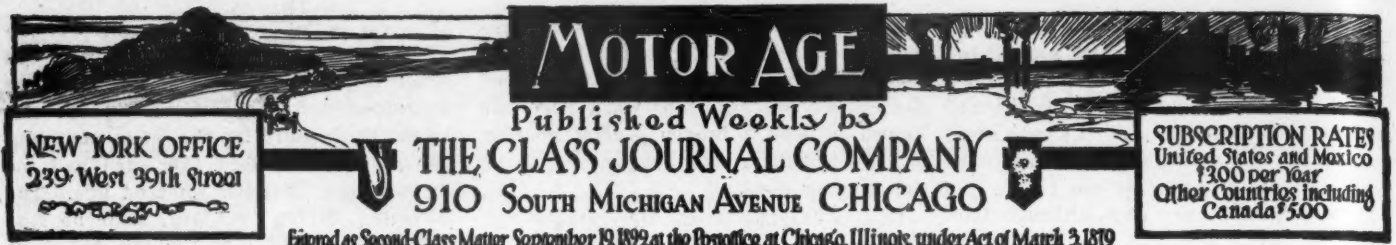
Wishart's Mercer, No. 14, pulled in at the pits at the end of its twenty-first lap of the course with oil running in a stream from a broken oil lead from the tank at the rear. The motor was smoking hot and needed water badly. While Wishart filled the crankcase of the motor with oil, his mechanic endeavored to fill up the water circulating system. When water could be retained in the system, it was found that the water pump housing was broken and the cooling water ran out of it. Nevertheless, Wishart started up again after a loss of 5 minutes and ran three more laps.

TIRE AND MOTOR EQUIPMENT AND CYLINDER SIZES OF ALL THE CARS STARTING IN ELGIN RACES

1st day	2nd day	Car No.	Car	Bore	Stroke	Piston displacement	Magneto	Ignition system	Carbureter	Tires			Gear ratio	Speeds	Direct drive	Shock absorbers
										Make	Size Front	Rear				
..	1		Knox six.....	4 1/4	5 1/2	389.9	Bosch ..	2 spark in- dependent	Rayfield	Michelln	36-4 1/2	37-5	1.95	3	3	Mondex
..	2		Mercedes	5 1/2	7 1/2	587.9	Bosch ..	Double	Rayfield	Michelln	34-4	35-5	2.3-5	4	3	Truffault-Hartford
41	3		Mason Spl.....	3 3/8	5	235.8	Splitdorf	Dual	Schebler	Michelln	32-3 1/2	32-3 1/2	2 1/2	3	3	Mondex
..	4		Mercedes	5 1/2	7.06	644.6	Bosch ..	Double	Rayfield	Michelln	32-4	37-5	1 1/2	4	3	Mercedes
..	5		Fiat 70.....	5	7 1/2	589.0	Bosch ..	Double	Rayfield	Michelln	34-4	35-5	2 11-19	3	3	Truffault-Hartford
32	6		Falcar	4 1/2	5 1/4	280.6	Splitdorf	.....	Rayfield	Michelln	32-4	32-4	2 1-3	3	3	Truffault-Hartford
21	7		Stutz	4 1/2	5 1/2	389.9	Splitdorf	.....	Schebler	Michelln	34-4	35-5	2 1-3	3	3	Truffault-Hartford
..	8		Benz	6 1-5	6 3-10	670.0	Bosch ..	2 magnetos.	Benz	Fisk	36-4	36-4 1/2	.....	4	3	Bend and Mondex
33	10		Falcar	4 1/2	5 1/4	280.6	Splitdorf	.....	Schebler	Michelln	34-4	34-4	2 10-19	3	3	Truffault-Hartford
23	11		National 40.....	5	5 11-16	442.0	Splitdorf	.....	Schebler	Michelln	34-4	34-4	.....	3	3	Truffault-Hartford
24	12		Stutz	4 1/2	5 1/2	389.9	Splitdorf	.....	Schebler	Michelln	34-4	35-5	2 1-3	3	3	Truffault-Hartford
35	14		Mercer 35.....	4.39	5	309.0	Bosch ..	.....	Rayfield	Firestone	32-4	32-4	2 1/2	3	3	Truffault-Hartford
36	15		Mercer 35.....	4.39	5	309.0	Bosch ..	.....	Rayfield	Firestone	32-4	32-4	2 1/2	3	3	Truffault-Hartford
42	17		Ford 1911 T.....	3 3/4	4	283.5	Bosch ..	Single	Klingston	Michelln	30-3	30-3 1/2	3	3	3	None
43	18		Herreshoff 20.....	3 3/8	5 1-16	201.0	Bosch ..	Single	Rayfield	Michelln	32-3 1/2	32-3 1/2	2 1/2	3	3	Truffault-Hartford
31	19		Mercer	4 1/2	5	300.7	Bosch ..	.....	Rayfield	Firestone	32-4	32-4	2 1/2	3	3	Truffault-Hartford
34	20		Mason	3 3/8	5	241.7	Splitdorf	.....	Rayfield	Michelln	32-4	32-4	2 3-5	3	3	Truffault-Hartford
22	21		Rayfield 6.....	4	5 1/2	276.5	Mea	Rayfield	Michelln	35-4	35-4	2 1/2	4	3	Mondex

* Firestone front, Prowadink rear

† Planetary



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Road Racing Retains Its Popularity

IN spite of the publicity talks from motor car manufacturers during the last 2 years that road racing was declining, the fact remains that with the public it is just as popular today, if not more popular than it was a few years ago. True that within the last 5 years the scenes of great road contests have changed; Long Island, the American cradle of the sport, is no longer a factor, its motor-famed parkway is idle because military protection cannot be had. Savannah, which set the pace for military guarding of courses and building of special roads with banked turns, took the stage after Long Island, but it, too, last year surrendered the field to Milwaukee, which will make its debut in a couple of weeks. Chicago, the hub of the bicycle field, laid its claims to road racing consideration 4 years ago when the Crown Point events were staged; since then the discovery of the Elgin circuit and three successful successive meets on it have demonstrated that the populace of Illinois, Wisconsin, Indiana, Iowa and Missouri are not tiring of road racing events, but that the interest is greater on every successive year. But the field of interest has increased: Southern California has established its right to consideration; this year Tacoma and Portland have widened the field of influence on the coast, carrying it to the northern boundary and beyond; and now Texas has established itself in no uncertain manner by its beach events.

ALL of this in spite of the manufacturers' claims that racing does not pay and that the people are not interested in it. The people are not interested in certain kinds of racing, but they are in properly conducted road races. The hippodrome mile-track events of fly-by-night promoters have done more to tarnish the good name of racing than anything else in the field. From many cities have come the storms of protests on track meets in which outside competition was virtually barred and on the unsuspecting public inflicted a few so-called races in which the varying cars of the same promoter were pitted one against the other. In over 50 per cent of the towns and cities where such meets have been held racing has been injured and the cause of motoring in general has suffered.

COMPETITION in all race events is what is needed, and not improvised contests in which the winners were known before the start of the event, and in which the event was staged solely for the benefit of a promoter with his group of racing cars. The track meet has long outlived its usefulness in America. Had the mile-track atmosphere been kept up to the high standard that road racing has it would be in a healthier condition today than ever before, but promoters failed to carry out promises of oiling tracks, of removing fences at the turn, of paying cash prizes, of delivering trophies, of preventing hippodroming, and a dozen other things that should have been done. The result: Track racing on mile courses is in ill-repute from one side of the land to the other. The confidences of the public have been shattered so often that scarcely a moiety remains. So much bad has taken place that it is questionable if a restoration is possible.

THE car manufacturer is today talking of going into road racing next year. He is talking, whether for publicity or not yet remains to be proven, of building his special racing cars,

and setting aside an appropriation of \$40,000 or \$50,000 to cover the entire season. He is going into it in the same desultory fashion he did a few years ago—win a contest and endeavor to live on its publicity for a year or 2, or perhaps 3. France tried to do this and failed. It is back in the fold. The makers supported a big grand prix race this year and for next year they already have laid their plans and are going into it stronger than ever in their history. They are returning to it because it pays, because it is one of the most convincing means of demonstrating to the public and because the public demands it. The crest of the wave of aviation exploitation passed. Last year was aviation year in France—it was overdone. The meets palled on the spectators. Car makers found to their surprise that the aeroplane had not permanently wrested the field from the motor car. The stampede of a moment is over for the present. The road race has an interest that is lacking in the aviation race. French car makers have been shrewd enough to grasp the occasion, and next year will witness a storm of road racing enthusiasm over France similar to that of years ago when the road race was at its zenith.

THIS year has been a slow and selfish one for the American car maker. He has kept out of hill-climbs, he has kept out of reliability runs and he has tried to keep out of racing. Those few makers who have taken advantage of the moment have profited well by their tact and business acumen. But road racing and contests have been more or less without a rudder. The manufacturers have let them slip away from them a little, by their lack of interest, and the promoter has been called upon to use extraordinary efforts to keep the movement going. The result is an avalanche of free-for-all events, which mean little to the advancement of car manufacture today. The type of motor in use is often as unlike that of the stock car as it is possible to make it; in several it is not. Regulation has been sadly lacking in these regards. The campaign has not been well balanced out; it has followed the whims of a few and not the requirements of the industry.

FORTUNATELY France, which has always been a guiding star, has entered the breach. For next year she has already announced her plans. The motor sizes are limited and the gasoline consumption is limited. These are excellent restrictions. America requires something of this nature. Our contests should play the role of pioneers and not be consolation affairs for over-size monsters built for other days. Racing needs regulation today more than ever before. It needs wise regulation—regulation based on mature contemplation of the future; contemplation that weighs accurately the factors of the present; and contemplation that gives due recognition to the course of motoring development up to the present. This year the Manufacturers' Contest Association, which should be a persistently active body, has largely been a passive one; the Contest Board of the American Automobile Association has also been too passive. Suddenly one by one a stampede will set in, and then it is doubtful if precipitous action does not occur. When this stampede, this landslide, does set in, its popularity will be in doubt no longer either in the minds of the public or those more intimately interested in the industry.

American Cars in Foreign Markets

WASHINGTON, D. C., Aug. 31—According to figures compiled by the federal bureau of statistics, \$30,000,000 worth of American cars and parts found markets abroad during the fiscal year 1912, as against less than \$1,000,000 worth 10 years ago. The figures show that the exports of motor cars to foreign countries in the fiscal year were valued at \$21,500,000, or of parts thereof, including tires, \$6,750,000. If to this were added the shipments to Hawaii and Porto Rico, we get for the year's sales of American cars outside of continental United States a round \$30,000,000, since the value of motor cars and parts thereof sent to Porto Rico was nearly \$1,000,000 and to the Hawaiian

More than \$30,000,000 Worth of Motor Products Was Shipped in a Year

Islands a little over \$1,000,000. The total number of cars exported to foreign countries was 21,757, valued at \$21,550,139, averaging slightly less than \$1,000 each, while those to the noncontiguous territory were higher, averaging \$1,600 each.

The export price of American cars in 1912 averaged less than in any earlier year in the history of the export trade. The average for 1912, dividing the total number of cars exported into stated value, was \$990 each, against \$1,100 in 1911,

\$1,380 in 1910, \$1,700 in 1909 and \$1,880 in 1908.

On the import side the motor cars imported last year amounted to but about \$2,000,000 in value, against more than \$4,000,000 in 1907. The average import value of the cars brought into the country last year was \$2,216 each, against \$2,138 in 1911, \$1,936 in 1910, \$1,788 in 1909 and \$2,392 in 1908. Thus the export price of American cars has fallen from \$1,880 in 1908 to \$990 in 1912, while the import price of foreign cars entering the country has only fallen from \$2,392 in 1908 to \$2,216 in 1912, the reduction in price on the export side being 47 per cent and on the import side but 8 per cent.

September 9-12—Chicago Motor Club's truck demonstration.

September 8-25—San Sebastian Rally.

September 9—French Grand Prix; Le Mans, France.

*September 9-12—Commercial vehicle run; Chicago Motor Club.

September 11-14—Third annual reliability run of Automobile Club of Buffalo, Buffalo, N. Y.

September 14-21—Annual fall show; Chicago Automobile Trade Association.

September 17—Grand Prix; Milwaukee, Wis.

*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.

*September 21—Vanderbilt road race; Milwaukee, Wis.

September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.

September 25-October 6—Agricultural exhibition and plowing matches; Bourges.

September 30-October 6—American Road Congress; Atlantic City.

September—Track meet; Universal Exposition Co., St. Louis, Mo.

October 4-5—Track meet; Sioux City Auto Club, Sioux City, Ia.

October 6—Gallou hill climb.

*October 7—National tour Detroit to New Orleans; American Automobile Association.

Coming Motor Events

*October 7-11—Chicago Motor Club reliability run, Chicago.

October 12—Track meet; Rockingham park, Salem, N. H.

October 24-25—Banta Trophy Team match, Chicago Motor Club.

November 2-3—Splash guard competition; Versailles.

November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

September 23-Oct. 3—Rubber show, Grand Central palace, New York.

September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.

October 2-12—Fire show, Madison Square Garden, New York.

October 7-12—St. Louis show.

November 8-16—Olympic show; overflow

November 22-30 Agricultural Hall.

December 7-22—Paris salon.

January 6-11, 1913—Cleveland show.

January 4-11—Montreal show.

January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.

January 11-22—Brussels, Belgium show, Centenary Palace.

January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.

January 20-25—Philadelphia show.

January 25-February 1—Montreal, Canada, show.

January 27-February 1—Detroit show.

February 1-8—Chicago show.

February 10-15—Chicago truck show.

February 10-15—Minneapolis show.

February 17-22—Kansas City show.

February 24-March 1—Show at Omaha, Neb.

March 3-5—Pittsburgh show.

March 8-15—Boston show.

March 17-22—Buffalo show.

March 19-23—Boston truck show.

March 24-29—Indianapolis show.

Aftermath of Elgin Road Races Told by Ralph de Palma

SOME interesting sidelights on the feature races of Saturday were told by Ralph de Palma, who stated that without a doubt it was the hardest contest in which he had ever participated. The weather was the hottest which has visited the middle west this year, and the boiling sun beat down furiously upon the speeding drivers, much to their discomfort. According to de Palma, the back stretch was the hottest, and was very much like an oven, despite the fact that the big Mercedes which he was driving was travelling at a speed nearly 70 miles an hour. The heat from the engine swept directly back to the car's occupants to add to the sun's rays.

De Palma changed three tires during the 305-mile run, all at the pits. This, of course, means that after each blow-out, he drove for some distance on the flat damaged tire or rim. It undoubtedly was quicker to do this than to stop at the point at which the tire gave way, since the facilities for change were better and quicker at the pit.

The Italian used a total of 29 gallons of gasoline for the thirty-six lap free-for-all, thus averaging 10.5 miles to the gallon. His tank has a capacity of 49 gallons, and while at the pit on one occasion he took on 10 gallons. On Friday the Merz Stutz used 21 gallons in the Illinois cup race and the Anderson Stutz 20 gallons in the same race.

Speaking of the course, de Palma stated that it was one of the best on which he has driven, and that it was an easy matter to pass any other car, the width being amply sufficient. At 90 miles an hour the slight roughness of the road surface is not noticeable at all, he stated, while at 60 miles, the unevenness is only slightly perceptible, and is by no means a disturbing factor. The course is better than that over which the French grand prix is run in that respect, in the recent French event he being obliged to run along for some 15 miles at certain parts of the French course before he was able to pass any other car.

On the twenty-ninth lap, the air pres-

sure in the gasoline tank became so great that it was necessary to stop at the pit to reduce it. It had reached about 8 pounds to the square inch.

Some mechanical details of the Mercedes which de Palma drove may be of interest. The motor has a bore of 131.8 millimeters and a stroke of 180 millimeters, giving it a piston displacement of 599.2 cubic inches. In English units, the millimeter measurements given above are 5.2 by 7.06 inches. The carburetor is a Rayfield, while the magneto is of Bosch make of the two-spark type. The spark was set for 5-16-inch lead. The gear ratio on high is 1½ to 1. There is no direct drive to the car, power being transmitted through gears for any speed. The horsepower developed by the motor which is of four-cylinder type is 37 at an engine speed of 400 revolutions per minute and 90 at 1,650 revolutions. The pistons are of cast iron and are fitted with two rings each. At the top, these pistons have a clearance of .03-inch, at the middle .02-inch and at the bottom .015-inch.

Thomas Company in Receivers' Hands

Extension Notes Are Not Met and Big Buffalo Concern Is Thrown Into Courts—Resignations of Officials Now Before Creditors' Committee—Future of the Business

BUFFALO, N. Y., Aug. 31.—The E. R. Thomas Motor Car Co. is in the receivers' hands. The receivership of the Thomas plant resulted from action in equity brought by creditors on the grounds that the Thomas company, while entirely solvent, was temporarily unable to meet its obligations. Extension notes given at the time of the reorganization of the Thomas company a year ago could not be met at maturity. The notes, which totaled \$250,000, fell due this year on August 1. The holders of \$210,000 worth of these notes agreed to grant a 3-month extension but holders of the remaining \$40,000 declined.

Judge John R. Hazel in the United States federal court here last Thursday granted an order appointing George C. Finley, secretary of the H. D. Taylor Co., and Adolph Rebadow, attorney, of the law firm of Rebadow & Ladd, receivers. The order provides that the receivers are to continue the business of that concern, and bond for the receivers was fixed at \$50,000. Application for the appointment of receivers for the Thomas company was made by Charles B. Sears, of the law firm of Rogers, Locke & Babcock. The E. R. Thomas Motor Car Co. was represented at the hearing by William L. Marcey, of Moot, Sprague, Brownell & Marcey.

The E. R. Thomas Motor Car Co. succeeded about a year ago to the business of the E. R. Thomas Motor Co. when that concern was reorganized. The liabilities of the Thomas company today are said to be \$960,000 while assets total \$1,700,000.

Merchandise creditors of the Thomas company are to hold a meeting in the near future and it is anticipated that a reorganization of the company will be the result. At the meeting which probably will be held this week the receivers of the Thomas company undoubtedly will act on the resignations of Frederick R. Humpage, president of the Thomas plant; William L. Gleason, vice-president and general manager, and John J. Ramsey, treasurer. The resignations are said to have been tendered together, but authorities in the Thomas plant decline to give further statements on the matter until action has been taken by the company's receivers. President Humpage declines to state why he resigns from the concern, but probably will discuss the matter after the receivers' action.

Concerning the matter of the continuation of the business of the Thomas company, George C. Finley, receiver for the concern, has this to say:

"I am unable to say at this time just

how long the business will be continued. The receivers have taken hold of it, and intend to put the business on its feet if that is possible. Of course, we do not know just at present what the exact conditions are in the plant. The permanent continuation of the business will depend greatly upon what we find."

The forces of the plant were reduced about 200 in number on Saturday, but the business will be continued if it is found possible.

SHOW AT INDIANA FAIR

Indianapolis, Ind., Sept. 2.—A motor car show is being held at the Indiana state fair in this city this week. This is the first time there has been any elaborate display of motor cars at the fair, it being difficult in the past to secure sufficient space to make an attractive exhibit. The fact, however, that motor cars have rapidly displaced horse-drawn vehicles, has resulted in sufficient space for the motor cars and nearly a dozen firms are exhibiting. It is thought the display will attract much attention and result in many sales among the farmers, who are the fair's chief patrons.

The big pavilion of the Studebaker Corporation, used in past years for showing horse-drawn vehicles made by the company, is being used this year by five motor car concerns. These are: The Studebaker Corporation, showing its line of gasoline cars; the Hearsey-Willis Co., exhibiting the Hupmobile and Mitchell; the Cole Motor Car Co., showing the complete Cole line; the Premier Motor Mfg. Co., showing the full Premier line and the prairie schooner, and the Nordyke & Marmon Co., with its line of four and six-cylinder pleasure cars

and light truck. The A. & M. Sales and Service Co. and the Finch-Freeman Auto Co. are exhibiting together in a tent, the former showing the Marion and American lines and the latter the Regal and Nyberg cars. The International Harvester Co. and the Staver-Chicago company are also exhibiting motor cars. The fair will close Friday night and an attendance of 250,000 is anticipated.

INDIANAPOLIS PLANS A POW-WOW

Indianapolis, Ind., Sept. 2.—A national sales and advertising motor car conference and convention is being planned to be held in this city October 8 and 9, the idea having been suggested by J. J. Cole, president of the Cole Motor Car Co. Committees to arrange for the meeting have been appointed and are now at work on a program and inviting every motor car manufacturer and allied concerns in the United States and Canada to be represented.

It is thought that from 4,000 to 5,000 people representing the sales and advertising ends of the motor industry will be present. There is to be a mammoth banquet, and some of the best known advertising experts of the country will be on the program.

BROWN OUT OF MAIS COMPANY

Indianapolis, Ind., Sept. 2.—With the completion of the reorganization of the Mais Motor Car Co., recently sold at receivers' sale, it is announced that Will H. Brown has retired from the company. Mr. Brown was president and general manager of the company when it went into the hands of a receiver. Mr. Brown, about 2 months ago, organized the Brown Commercial Car Co., of Peru, and is president and general manager of the company. He will devote his attention to this company and will have his office in this city. He is now in New York City for a short time and will return home soon.



ALCO TRANSCONTINENTAL TRUCK AMONG WYOMING GULLIES

Stephenson Company Appeals to Courts

MILWAUKEE, WIS.—Sept. 2—The Stephenson Motor Truck Co., of Milwaukee, Wis., manufacturing Utility commercial cars at South Milwaukee, on Saturday, August 31, filed a suit in the circuit court at Milwaukee against the Pierce Motor Co. and the J. I. Case Threshing Machine Co., of Racine, Wis., charging them with violating an agreement whereby the Pierce and Case owners agreed to purchase the plant of the Stephenson company for \$100,000 worth of the capital stock of the Pierce company. The trial will be transferred to Racine county by mutual agreement and promises to be most interesting. The official complainants are George L. Stephenson, Charles Matthews, A. E. Halderman, Fred M. Stephenson, Paul Durant and Frederick Gettelman, and the official defendants are Frank K. Bull, Richard T. Robinson and F. Lee Norton.

The complainant charges that from the time of the alleged agreement, in January, 1912, the Case company agreed to act as sales agent for the Stephenson company until the Stephenson works were taken over on August 1, 1912. It is charged that the defendants have refused to comply and that the Stephenson company, by reason of discontinuing all of its own sales agencies, and announcing to its patrons that it was no longer selling its product directly, suffered a great decrease in sales and now has on hand a large number of motor vehicles which it cannot sell because of the termination of its own selling outlets.

It was stipulated, the complainant says, that if at the time of the purchase of the Stephenson company's plant, scheduled for August 1, 1912, the assets amounted to less than \$40,000, the difference was to be subtracted from the amount of the capital stock to be paid to the directors of the Stephenson company, and that if the assets exceeded \$40,000 in value, an additional amount of stock was to be added to the consideration.

Maker of Utility Truck Claims Pierce Motor Co. and J. I. Case Threshing Machine Co. Violated Agreement to Purchase His Plant—Suit Started in Milwaukee

It is stated that the Stephenson company became affiliated with the Pierce and Case companies because of the desire to add commercial vehicles to the Case line of products, which includes Case cars, manufactured by the Pierce Motor Co., which is owned by the directors of the Case company.

STROMBERG OFFICIAL KILLED

Chicago, Aug. 30—J. R. Ballinger, for four and one-half years connected with the Stromberg Motor Devices Co., Chicago, was accidentally killed today, when the Lozier car, which he was driving from Chicago to Elgin for the road races overturned in passing another machine. At the time of his death, Mr. Ballinger was assistant to the sales manager of the Stromberg company. When he first took a position with the concern he was employed as stenographer, and had risen rapidly to his present position. He was 27 years of age. No successor has as yet been appointed.

UNITED MOTORS' AFFAIRS

New York, Sept. 4—Friday, September 13, is the date upon which the 90-day extension granted by the creditors of the United States Motor Co. will expire and before that date a plan of reorganization will be presented to the creditors and owners of the company. In fact, three different plans have been suggested to the creditors' committee and while official confirmation is lacking it is quite certain that one of the plans modified by suggestions of the merchandise creditors will be favorably reported. The first draft of this plan has been prepared but pending official action those interested decline to say anything about it.

Meetings of the committee have been held three different times within the past week and the announcement of the main facts contained in the plan may be expected at any time. It is understood that some additional capital is necessary and that it will have to be that one or more of the companies connected with the organization will have to curtail its production and that the 1913 manufacturing campaign, already well under way, will be conducted on conservative lines so as to avoid extraordinary calls upon the company's resources prior to the season when adequate returns are available, to meet such calls.

At the headquarters of the company it was learned that shipment of the 1913 product is continuing satisfactorily and, while all the officers are guarded in their statements, there is a feeling of growing optimism as to ultimate results.

On the New York curb a sharp break was scored in both common and preferred issues but later there was a good recovery, the net loss being only fractional. It was reported after the break that the selling pressure was by speculators, who had loaded up at recent lower levels and took profits on the subsequent rise.

RECEIVER FOR KING COMPANY

Detroit, Mich., Sept. 4—An order appointing the Union Trust Co. receiver for the King Motor Car Co. was given by Judge Tuttle in the United States district court here on September 3. It is probable that the plant will be sold within 2 weeks, although there has been no adjudication as yet. It is expected that the King company will shortly file a petition in bankruptcy which will clear up the case and permit of the quick sale of the plant.

KELSEY RESUMING

Hartford, Conn., Aug. 30—The manufacture of the Motorette, a three-wheeled machine, will be resumed next week by the Kelsey Motor Co., successor to the C. W. Kelsey Mfg. Co., which failed some time ago due to its inability to get parts. The new company will manufacture its own motors and has changed from the two-cycle to a four-cycle motor of standard design.

SHOW AT MINNEAPOLIS

Minneapolis, Minn., Sept. 2.—Unexpected demand from the country for agencies is the interesting feature of the annual Twin City dealers' show in the grand stand at the Minnesota state fair, September 2-7.



ALCO TRANSCONTINENTAL TRUCK AMONG WYOMING GULLIES

Milwaukee's Meet Next on the Program

Badgers Set the Stage for the Grand Prix and Vanderbilt Races and Expect Fine Lot of Entries—France Decides to Put on Another Road Race Next Year—Sunbeams Enter 1913 Classic—Calgary's New Speedway Tried Out

MILWAUKEE, Wis., Sept. 3—The gaze of the motoring world, temporarily shunted to Elgin, has fallen back on Milwaukee, and from today until September 17, when the American grand prix, the first of the four international road racing classics, is pulled off, it will be the aim of the Milwaukee Automobile Dealers' Association, promoter of this de luxe edition of speed, to keep that gaze centered fast and hard on the big western city which heretofore has been reputed principally for its breweries.

Many Entries Promised

The line-up of entries up to September 1 shows more than thirty-five cars already in and money down. That there will be at least fifteen or twenty more is believed to be a foregone conclusion, as tentative entries already in the hands of Starter Fred J. Wagner are enough to cover this number. However, the Milwaukeeans are not figuring on anything where the money is not in sight and its guess of fifty-five contestants in four events is based on actual figures. Entries for the grand prix do not close until next Tuesday, September 10, while the books on the Vanderbilt, Pabst and Wisconsin Challenge will be open until Saturday, September 14.

Official practice on the Milwaukee course will not be permitted until September 11. Manager Ruddle has decided that the drivers can become fully acquainted with the course in a few days and there is no use in inviting conflict with the farmers by closing the public roads, if only for a few hours daily, until it is absolutely necessary. The course is so very close to the city that the chances are it would be crowded with spectators during the practice, these crowds growing as the length of the practice time is increased. This would necessitate a large expense for policing. Beginning Wednesday, however, the roads will be closed to travel from 11 o'clock a. m. until 1 o'clock p. m., giving the drivers 2 hours each day for from 7 to 10 days in which to figure out their race dope.

Hughes, manager of the Mercer team, will be the first to pitch his camp at the Milwaukee course. He has selected a fine spot near a graveyard for his tents and shacks, running the risk of being haunted by ghosts. The camp will be pitched before Thursday noon, according to advices from Chicago today. The other entrants will file in slowly during the present week. Manager Ruddle has provided thirty-five distinct camps along the course.

R. W. Saunders, who had the job of oil-

ing the Savannah course last year and 2 years ago, is supervising the same work for A. B. Chamberlain, of New York, at Milwaukee. By Thursday afternoon every part of the course will be completed, save for the oiling, which Mr. Saunders figures can be finished up in 3 days thereafter. The rains during the last 3 weeks interfered somewhat with the progress of the course construction, but even with the slight delay the completion day will come well within the time limit prescribed in the bonds given by the contractors.

An interesting experiment is to be made by the Wisconsin state highway commission during the races. The course is composed of several stretches built of different materials, and the commission's experts will make frequent inspections during the races and a thorough examination after the last event to determine which kind of material has withstood the pounding of the heavy racing machines best. The information will come in good stead in the selection of materials for highway work throughout the state, as the roads rebuilt for the cup races are constructed under the approved formulae of the commission and are not special in any sense of the word.

Fowler Will Do Scoring

The four races at Milwaukee will be scored in the most modern way yet devised, the entire scoring system of the Elgin course being brought to Milwaukee intact. The M. A. D. A. has arranged with H. N. Fowler to handle this end of the game and the Chicago Automobile Club and Elgin Automobile Road Race Association have graciously consented to loan their fine devices to Milwaukee. The main board will be placed at the left of the judges' stand, as viewed from the grand stand, and there will be four other boards, one at each corner of the course, operated by wire from the main one, so that all spectators will be apprised of the standing of the contestants at practically one and the same time.

C. H. Warner, of the Warner Instrument Co., Beloit, Wis., has consented to supervise the electrical timing system, which is his invention and of his own manufacture. The horograph will be installed some time early next week and will be ready to do some timing in the practice work. The course will be accurately measured on Wednesday, September 11, and it is expected that the length will be approximately 8.215 miles, since two turns were cut away and one tortuous stretch straightened, making the whole circuit shorter than that at Elgin.

The M. A. D. A. has set a new pathway for other promoters to follow by taking

out an insurance policy of \$150,000 covering all liability for damages for personal injury, damage to property, and other risks that it assumes as promoter of the big meet. In this way every person viewing the races under proper credentials, viz., an admission tag, will be protected and the proceeding means, in fact, that the M. A. D. A. has taken out an insurance policy on every patron of the races.

Peugeot Cars Not Coming

Paris, Sept. 3—Special cablegram—After making all arrangements for participating in the grand prix of America, and even booking passages on one of the French steamers, it has been decided that the Peugeot team will not cross the Atlantic. The exact reasons for the decision have not been announced, but it is believed that in view of the small amount of business done in the United States the firm was of the opinion that the results would not justify the expense. One of the Peugeot grand prix racing cars has been entered in the Boulogne meeting, where it will run in the short distance races, and two big and two small cars will be started in the long distance road race at Le Mans on September 9.

ANOTHER FRENCH ROAD RACE

Paris, Aug. 20—In addition to the important official grand prix to be held next year by the Automobile Club of France under a fuel limitation rule of 14.1 miles to the gallon, it is intended to hold a long-distance road race for cars having a cylinder area of not more than 3 litres, or 183 cubic inches. This latter race is being organized by the newspaper L'Auto, and will doubtless have the same rules as those in force for the 3-liter class at Dieppe this year.

The date has not been fixed, but it is probable that the end of June will be decided on. There is every possibility of the hilly Boulogne course being selected for the holding of the race. The two races are in no way antagonistic. The Automobile Club grand prix, with its allowance of 20 liters of gasoline per 100 kilometers will unite cars of about 4 by 8 inches bore, developing 140 to 150 horsepower, whereas in the 3-liter class the average dimension will be 3.1 by 5.8 inches bore and stroke.

This race will be the third occasion on which cars have been run in France under the 3-liter rule and probably will be the last. The organizers of the race are of the opinion that three successive races are necessary to obtain full benefits from any set of rules; thus all the lessons having been learned as the result of the 1913

event, the following year the light-car grand prix doubtless will be held under limited gasoline rules with, in addition, a fixed allowance of lubricating oil for the distance to be covered.

CALGARY'S NEW SPEEDWAY

Calgary, Alta., Aug. 30.—When a bunch of millionaires—not the kind the papers talk about, but the kind that the banks will guarantee for seven figures, undertake to make a hobby out of a motor speedway, you can pretty nearly take it for granted that there will be a classy course.

Such is what happened in Calgary. Last year the Southeast Calgary Corporation, composed of some of Calgary's richest men, decided that they wanted something novel in their part of town. Daniel W. Trotter suggested a motor speedway. The company owned a stretch of prairie 6 miles by 2 miles. When Mr. Trotter got the idea that he wanted the speedway, he got it bad and he found an enthusiastic supporter in O. S. Chapin, himself the Alberta agent for the Overland car and a rich implement dealer. The other directors gave them a free hand and the Grid-iron speedway, so named because they wanted it to be "the hottest spot on earth" was the result.

Just what the cost of that 4-mile straightaway track is, no one will tell, but it must have been \$20,000. Mr. Trotter donned overalls and personally superintended the work. It was completed in 90 days and on August 10 it was formally opened and is now free to the motorists of Calgary. And there are many motorists in the hub of Alberta, which boasts of a car for every nineteen families.

Three records went by the boards when the track was formally opened. Barney Oldfield, Bill Fritsch and Lew Heinemann were the professional drivers invited to compete. All the motorists of Calgary were invited to try their speed and a card of sixteen numbers was arranged.

Oldfield drove his 300-horsepower Christie a mile in :41 4-5 on the first attempt. Then he sent the car against the 1/2-mile road record and was caught in :18 1-5. The speedway is not a prepared course but just an extra good roadway. Bill Fritsch then took the Cino a mile against time and was caught in :46 1-5.

HILL-CLIMB AT MOLINE

Moline, Ill., Sept. 2.—More than 5,000 people lined the Sixteenth street hill this morning and watched Jack Stickney in a stripped Velie make the best time of the day, taking the free-for-all with a mark of 17 seconds flat. Stickney and Rose, both Velie drivers, carried off a majority of the honors, winning three firsts and a second. Oscar Priester of Davenport in a Pope-Hartford, won the Josephson cup in the amateur drivers' class, making the good time of 17 1/4. The Pope-Hartford cars took second honors with two firsts and two seconds. Summary:

\$1,000-\$1,800 class—Rose, Velie, won; time, :20. Stickney, Velie, second. Time, :21 1/4.
\$2,000 and under, four passengers—Rose, Velie, won; time, :22. Only one entry.
Free-for-all—Stickney, Velie, won; time, :17. Only one entry.
Over \$1,800—French, Lozier, won; time, :18. Peterson, Pope-Hartford, second; time, :18 1/2.
\$1,000 and under—Knowles, Overland, won; time, :21. Only one entry.
\$2,000 and over, four passengers—Priester, Pope-Hartford, won; time, :18. Peterson, Pope-Hartford, second; time, :19.
Amateur class—Priester, Pope-Hartford, won; time, :17 1/4. French, Lozier, second; time, :18 1/2.

SUNBEAMS IN 1913 GRAND PRIX

Paris, Aug. 24.—The first entries for the French 1913 grand prix race are three Sunbeam cars built by the Sunbeam Motor Car Co. of Wolverhampton, England. No other entries have yet been received, but no doubt is felt as to the possibility of obtaining the minimum number of forty cars before the final closing on October 31. The race, as already announced, will be run under a fuel allowance equal to 14.1 miles to the gallon.

WET TRACK STOPS MEET

New York, Sept. 3.—A Labor day meet held on the Brighton Beach 1-mile track on Monday and which was scheduled to include seven events, was broken off after the fifth because Bob Burman declined to race on the wet track in his new 300-horsepower Blitzen Benz II. The other productions were a 5-mile match race between an E-M-F and a Bergdoll, the former, driven by Billy Burke, winning in 6:2.35;

a 5-mile race between Stutz, White and Marion, finishing in the order named, with Stutz arriving in 5:16.61; the same Stutz and White cars and their drivers ran against Burman in his Ohio, which was disabled on the homestretch of the first lap, which race also covered 5 miles and was won by the White in 5:5.14; the first heat of a match race for the Remy brassard, between Burman in the Blitzen Benz, Hickman in a Mercedes, Kyle in the White and Grennan in another Benz, Burman going to a spectacular finish; a 25-mile race between two Bergdolls, a Marion, Stutz, White and Cutting, the latter driven by Burman and finishing in 25:28.56, beating the White by 12 seconds. The grandstand was filled fairly well.

REPORT ON RUBBER MARKET

New York, Sept. 2.—Imports of crude rubber for the week ending August 24 amounted to 14,272 packages to which must be added 1,673 packages of waste, the whole valued at \$1,768,000. The waste was valued at \$59,000. Local trade has been quiet and, while the actual sales are said to be small, the volume of imports in connection with the steady market means that the demand is sufficient to maintain prices. This would argue in favor of a large general business. Prices remained about stationary throughout the past week, the level being at \$1.20 1/2 per pound for up-river fine.

Relation of Load to Chassis Weight

IN THE accompanying table are given the averages of the actual weights of American motor truck chassis of the various load capacity ratings, as supplied by the manufacturers of 325 gasoline vehicles and forty-nine electric models. Also, the means of the average weights, and for comparison, the average of the weights of from three to ten of the most successful makes of trucks on the market in each capacity rating.

For example, the average of the chassis weights of forty-nine different makes of 3-ton gasoline trucks is 5,509 pounds. To bear a uniform relation to the average weights of all other capacities, the weight should be 5,600 pounds. But the average of actual weights of ten well-known and successful makes of 3-ton trucks is 6,070 pounds, which exceeds the average of the forty-nine makes by 470 pounds, according to the figures.

Reference to the table will show that in most truck sizes the average weights of the selected few representative makes of gas trucks are in excess of that of all makes combined. The conclusion is that the companies that have had most experience rate their trucks lower or build them heavier and stronger than the new makers, or than those who have met with less commercial success. The table is given in the next column.

LOAD RATINGS AND CHASSIS WEIGHTS OF MOTOR TRUCKS GASOLINE VEHICLES

Capacity rating, pounds	No. of models reported on	Av. actual chassis weight, pounds	Means of all chassis weights, pounds	Av. weight of 3 to 10 leading makes, pounds
500-800	11	1,221	1,300	1,373
1,000	23	1,786	1,780	1,728
1,200	10	1,880	2,000	...
1,500	34	2,190	2,400	2,331
2,000	46	2,986	2,900	3,230
3,000	30	3,727	3,750	3,536
4,000	44	4,505	4,500	4,721
5,000	4	5,125	5,050	5,233
6,000	49	5,509	5,600	6,070
7,000	10	6,080	6,100	6,100
8,000	16	6,423	6,550	6,500
9,000	3	6,381	7,000	...
10,000	32	7,603	7,400	8,232
11,000	1	7,800	7,750	...
12,000	4	7,920	8,150	...
13,000	3	8,966	8,550	...
14,000	2	8,700	8,900	8,700
15,000	..	..	9,300	...
18,000	..	..	10,500	...
20,000	3	11,240	11,250	9,800

ELECTRIC VEHICLES

500-800	7	2,375	2,375	2,540
1,000	11	2,755	2,750	2,700
1,500	3	3,518	3,300	3,350
2,000	7	3,525	3,800	3,716
2,500	4	4,270	4,300	...
3,000	2	4,124	4,750	...
4,000	6	5,592	5,600	5,439
5,000	..	..	6,250	...
6,000	1	7,000	6,900	7,000
7,000	4	7,439	7,400	7,851
8,000	..	..	7,850	...
10,000	3	8,438	8,700	8,438
12,000	1	10,000	9,500	...
49				

Glidden Pathfinders Complete Work

NEW ORLEANS, La., Aug. 30—The route for the annual national reliability run of the American Automobile Association has been completed, the pathfinders in the Flanders electric reaching the end of their journey last Wednesday after having traveled 1,721.7 miles from Detroit.

The pathfinding trip was not one continuous round of pleasure because of the unusually rainy weather encountered within 200 miles of New Orleans, but the hospitality shown the party throughout the entire trip made it a fitting forerunner of the A. A. A. tour in October. All along the line thousands of people greeted the scouts cordially and expressed hearty appreciation of the work being done. The mapping of a national highway from Detroit to New Orleans was very much worth while.

Exactly 28 days from the time of leaving Detroit the pathfinding car completed the long grind. The actual running time was 21½ days, however.

The advent of the pathfinding car spurred every community passed through with determination to improve the roads. Especially was this true in the south, and Kentucky, Tennessee, Alabama, Mississippi and Louisiana are states that will be immensely benefited by the tour.

The New York to Jacksonville tour last year was a fine one, according to Mr. Westgard, but the Detroit to New Orleans run will be far greater. Indianapolis, Louisville, Memphis, Jackson and Baton Rouge are some of the intervening points, and citizens of those cities are keenly alive to what the visits of the tourists will mean.

It remained for New Orleans to cap the climax in the way of lavish receptions. The local committee, composed of I. B. Rennyson, Jos. O. Schwartz and L. K. Nicholson, had arranged a banner welcome. The first car to welcome the visitors Wednesday morning was that of Abner Powell. He met the pathfinder about 4 miles out, but it was at the corner of Oak street and Protection levee in Carrollton that the members of the dealers' association and others were waiting for the visitors. At that point a procession was formed which passed down St. Charles avenue to the city hall, where there was a formal welcome by the mayor. Here Mr. Westgard presented the silk flag given him by Mayor Thompson of Detroit to Mayor Gorman. In accepting, the mayor took occasion to express the hope that the tour would give the good roads movement an impetus in this section. Mayor Gorman drank the health of the pathfinder in champagne and felicitated Mr. Westgard on the successful termination of his trip, which was started exactly 1 month ago.

Mr. Westgard and his companions reported a rough time out of Corinth, Miss.

Scouts Blaze Trail from Detroit to New Orleans— Distance 1,721 Miles

It was found necessary to straddle the levee for 6 miles out of the Mississippi town. The 117 miles between New Orleans and Baton Rouge were very disagreeable on account of the rains, which made it almost impossible to travel over some of the roads, there being no bottom.

There was a luncheon tendered the visitors at the Gunewald Wednesday afternoon, the hosts being members of the local dealers' association.

CANADIAN REGULATIONS

Montreal, Aug. 27—In view of the steadily growing volume of motor tourist traffic between Canada and the United States, and vice versa, it is thought by local customs to be a fitting time for them to generally remind travelers of the rules and regulations to which they must conform if they wish to journey without inconvenience or delay.

For Canadian-owned cars going into the United States it was explained this morning by the official in the department of the chief collector of customs, the owner thereof must first ask permission from the local customs authorities to export his car for touring purposes.

When this has been done, the car owner will be supplied with two forms which must be made out in duplicate, giving name and address of owner with the name of manufacturer of the car, the manufacturer's number, the number of cylinders in the car, the style, seating capacity, color, style of running gear, with what extras,

glass windshield and speedometer, together with the numbers of each of the tires, back and front, and other details.

One copy of the lengthy form so made out is to be given to the customs office at the last customs port on this side of the line, while the other is kept by the car owner until he returns to Canada, when it is given to the customs officer for purposes of comparison with the duplicate in his possession.

In the case of American tourists coming into Canada not only must conditions like the aforesaid be complied with, but each car owned must deposit the sum of \$25 as a mark of good faith as well as a bond representing twice the duty collectable on the car. Thus, for instance, if an American car worth \$5,000 comes into Canada and on a basis of 35 per cent is liable to pay \$1,750 duty the owner must take out a bond for \$3,500, with some guaranteed bond company. The bond expires and the \$25 good faith money is handed back as soon as the American car leaves this side. If, however, an American tourist, coming into Canada, can produce two Canadians to sign a personal bond, the cash bond stipulation does not become necessary.

More than 500 cars, Canadian and American, have crossed the boundary line between this province and New York state since May 1 last.

MAKING DRIVING SAFER

Bloomington, Ill., Sept. 1—The La Salle Commercial Association has taken the initiative in a movement which may reach a climax in the legislature. It is proposed to put an end to the dangerous corners of the city and country streets and roads, passing a law, if necessary, prohibiting such corners. Many street corners are too



ARRIVAL OF GLIDDEN PATHFINDERS IN NEW ORLEANS

Illinois United in Good Road Cause

sharp, while many of the country road corners are marked by a dense mass of trees or shrubbery which hide approaching vehicles from view and thus invite accidents.

The La Salle association advocates the following: All street corners, instead of being square, as now, shall be given a radius of not less than 20 feet, so as to make a curve in passing from one street to another. No telegraph, telephone, lamp or other post, trees, shrubs or other obstructions may be placed within 20 feet of such corners. The corners of all country roads shall be cut back at an angle of 40 degrees, not less than 3 rods, and no trees, bushes or other obstruction to the view will be allowed to grow or be maintained within this angle.

RUNS INTO INSURANCE SNAG

New York, Sept. 2—The problem of motor car insurance, particularly as it applies to commercial vehicles, is still some distance from a solution. The matter was referred to James S. Marvin, assistant general manager of the N. A. A. M., for investigation and report and Mr. Marvin ran into an obstacle early in the proceedings. After conference with the insurance men Mr. Marvin found that the first element of information required from him by the insurance men was as to how long trucks are kept in garages and how long they are in service each average day. As such figures must be gained by a detailed canvass and as no such general detailed canvass has been made, the pursuit of that special line had to be postponed until such time as the figure should be available. Such a canvass will be undertaken in the near future to determine the time divisions in the life of trucks.

Down-Staters Launch Campaign to Improve the Highways

BLOOMINGTON, ILL., Sept. 2—Illinois motorists have launched a campaign in the interest of state roads and they will unitedly oppose the proposition to distribute the money accrued from licenses, among the various counties of the state.

There will be a battle royal in the general assembly over the method of disposing of the fund, estimated to reach \$1,000,000 by July 1 next when the distribution is to be made. The owners of cars make the point that the idea of dividing the money among the counties would give each \$10,000, thus improving a few miles with local benefit only. By lumping the sum and applying it solely for the construction of one state road, following the greatest line of travel, the state will contribute to the welfare and comfort of the many, attracting tourists from all the country.

It will be necessary for all owners of cars as well as others who favor the plan of building state roads first, to sound all candidates for the legislature and secure their views upon the subject. Commissioners of highways in most instances demand that the money be divided in proportion to the amount paid in, and will put up a strong fight in opposition to the state road plan. The motorists realize that the contest is no easy one and that it will require the earnest co-operation of every man who drives a car and all others interested in good roads, to win.

Secretary of State C. J. Doyle has just turned over to Secretary of State C. E. Russell \$26,000, which represents a few

weeks' accumulation of the motor registration fund and which brings the total on hand up to \$400,000. This fund can not be disturbed until the next legislature passes a bill determining its disposition. As such a measure is not likely to take effect until July 1, it is predicted that fully \$1,000,000 will be awaiting disposition, all received from motor car, motor cycle, and chauffeurs' licenses. The law requiring the collection of such license money failed to specify how it should be applied, except in a general way, that it must be used for the improvement of the public highways. The good roads committee, named by the last legislature, will submit a bill, specifying how this money shall be disposed of, but if it favors giving each county a small proportion, there will be a wave of protest and a demand for the centralization of the fund where it will show results.

Homer J. Tice, of Menard county, is chairman of the good roads committee. In discussing the need of road legislation, he said: "In the past 14 years, \$60,000,000 have been spent upon the highways of Illinois, and statistics show that 37½ per cent of this sum has been expended without permanent benefit. This represents a loss of \$22,000,000, while this is not a drop in the bucket compared with what has been lost in trade."

It is said that the Tice bill will provide for a state highway commission of three members, a state highway engineer and a county highway engineer, excepting that in the smaller counties, the county surveyor will act in lieu of a county road engineer. The measure will provide for the improvement of the main roads under the supervision of both state and county engineers and the improvement of the connecting roads under the supervision of the county engineers and township supervisors. The bill also will require the payment of all road tax in cash and the compulsory dragging of all dirt roads.

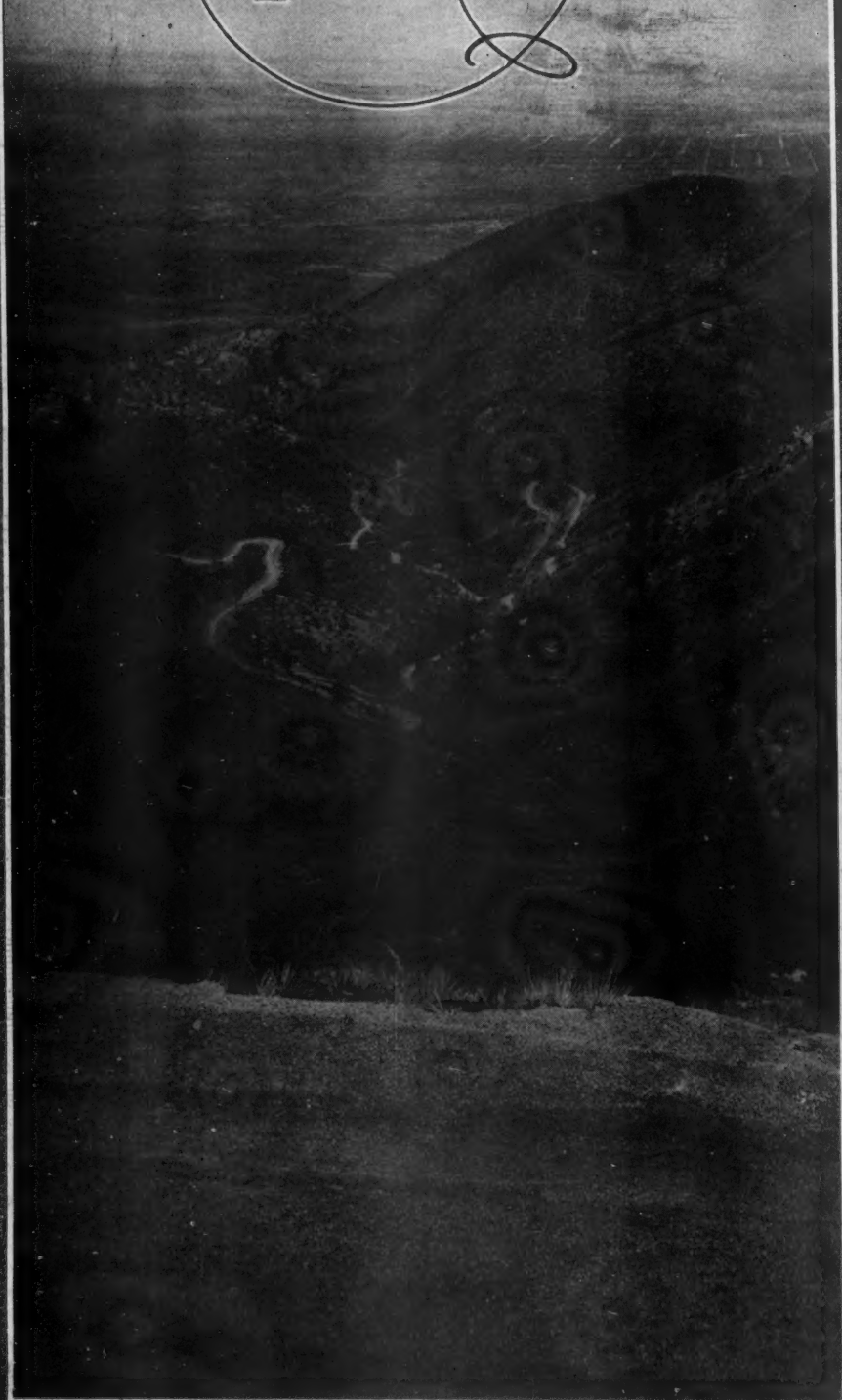
It is probable that the bill will be given extensive debate and probably receive numerous amendments before it finally becomes a law. The motorists want a state road between Chicago and St. Louis. When this is completed, they want another state road extending from Galena to Cairo. The third recommended will extend from Chicago to Rock Island, while the fourth will stretch from Danville to Quincy.

It is argued that these roads should be constructed in turn and that all contiguous counties should improve the laterals to connect their district with the main road. This in brief, is believed by the motorists to be the only satisfactory method of improving the highways of Illinois. Whether or not, they will be successful in convincing the members of the legislature, remains to be seen.



NEW ORLEANS CITIZENS AWAIT ARRIVAL OF GLIDDEN PATHFINDER

Routes and Touring Information



SEVEN ELEVATIONS OF EXCLAMATION POINT CAN BE SEEN FROM THIS POSITION WITH COLORADO SPRINGS AND THE PLAINS IN THE DISTANCE. THERE IS 1 MILE OF ROAD IN A 30-ACRE PLOT AT ONE POINT

Mountain Road for Motor Cars Only

IN the heart of the Colorado Rockies is a 30-mile motor car road, the last 9 miles of which is barred to other vehicles and which is claimed to be one of the world's finest scenic roads; there is no doubt of its being the very finest exclusive motor car road anywhere. It extends from Colorado Springs to Crystal park and makes a steady ascent of more than 2500 feet by a series of loops, bow-knots and switch-backs, a most remarkable piece of engineering. At one point, 7945 feet above sea level, a turntable has been built upon a rugged point, a device that saved thousands of dollars worth of road work. As it traverses one of the most rocky and precipitous regions, it was found necessary to blast the greater part of the road from the solid mountain side, while in order to preserve an easy grade, a succession of twists and turns was required which resulted in one place of the building of a whole mile of road in a thirty-acre piece of ground, probably the most crooked mile of road in existence.

The company which constructed this toll road is now operating a number of sight-seeing motor cars, a battery of specially designed mountain-climbing Packard trucks, which carry almost a score of passengers each, and besides the daylight trips, make moonlight and searchlight excursions to Crystal park. The advantages of the motor car over the steam cars with their dust and cinders give this trip an added popularity.

The views along the trip are unsurpassed, wonderful vistas of mountain and valley, with the cities of Manitou and Colorado Springs spread out like toy cities far below. A point of historic and literary interest on this road is the rough cabin in which the late John Hay, secretary of state, sought seclusion while writing his famous story of the life of Lincoln.

The grades range from 2 to 8 per cent, although the latter grade extends for only the length of a city block. It was necessary to build it so in order to get around the mountain at a certain point called Sublime View; while the balance of the road runs from 2 to 6 per cent.

Construction work on the mountain section was commenced in the fall of 1909 and the road was completed, ready for operation October 31, 1910; the total time used in actual construction of the road was less than 8 months, which was remarkably quick work considering the amount of blasting through solid rock which was required.

The total mileage in making the round trip from Colorado Springs to Crystal park is about 32 miles, and the time consumed is approximately 3½ hours, allowing for a stop-over at the park of from 20 to 40 minutes. Fare is \$2.50, but will be \$3.00 next season.

Cars are run on a regular schedule, leaving Colorado Springs at 9 a. m., 9:45 a. m. and 1:45 p. m.; returning in the afternoon at 1:15, 1:45 and 5:45. Additional trips are made at irregular hours for special parties, and sunrise trips are made through July and August, leaving at 3 a. m. and returning at 7:30 a. m. On these trips the ascent is made by search-light, giving the tourist a grand view of the Pike's Peak region by electric light, and stopping to view the sunrise at Point Sublime. There a panoramic view is obtained extending from below Fountain on the south, to Castle Rock on the north.

There are no villages or scattered habitations along the route, therefore, it is a purely scenic trip. It shows every point of interest in the Pike's Peak region, with the exception of the Seven Falls. The picture is continually changing, every curve bringing another and finer view to the sight of the traveler.

Unlike other mountain trips, in which the traveler is hedged in by canyons the greater part of the way, this road is in the open at all times. While the return trip is made over the same road, yet it opens up an entirely different series of vistas, and many tourists declare that the return is even more beautiful than the ascent. The cars run at the same speed

going and coming, covering the mountain section of 9 miles in an hour. This not only makes for safety, but allows ample time to enjoy the scenery.

The cars leave Colorado Springs from the corner of Tejon street, and Pike's Peak avenue, and after calling at various

leading hotels proceed up Colorado avenue, passing through West Colorado Springs and on toward Manitou. At the Crystal Park junction, the private road begins and extends clear to the park and the John Hay log cabin. The cost of building the road and equipping it with a fleet of Packard trucks with pullman bodies of special construction, represents an outlay of \$150,000.

There is no doubt that it compares favorably with many of the most famous mountain roads of the old world, visited by thousands of Americans who fail to realize the wonders of their own land.

MT. CARMEL TO TEXAS

Mt. Carmel, Ill.—Editor Motor Age—Please outline the following trips over the best routes:

- 1—From Mt. Carmel to Newport, Ark., to Houston, Tex.
- 2—From Mt. Carmel to Red Wing, Minn.—B. H. Kamp.

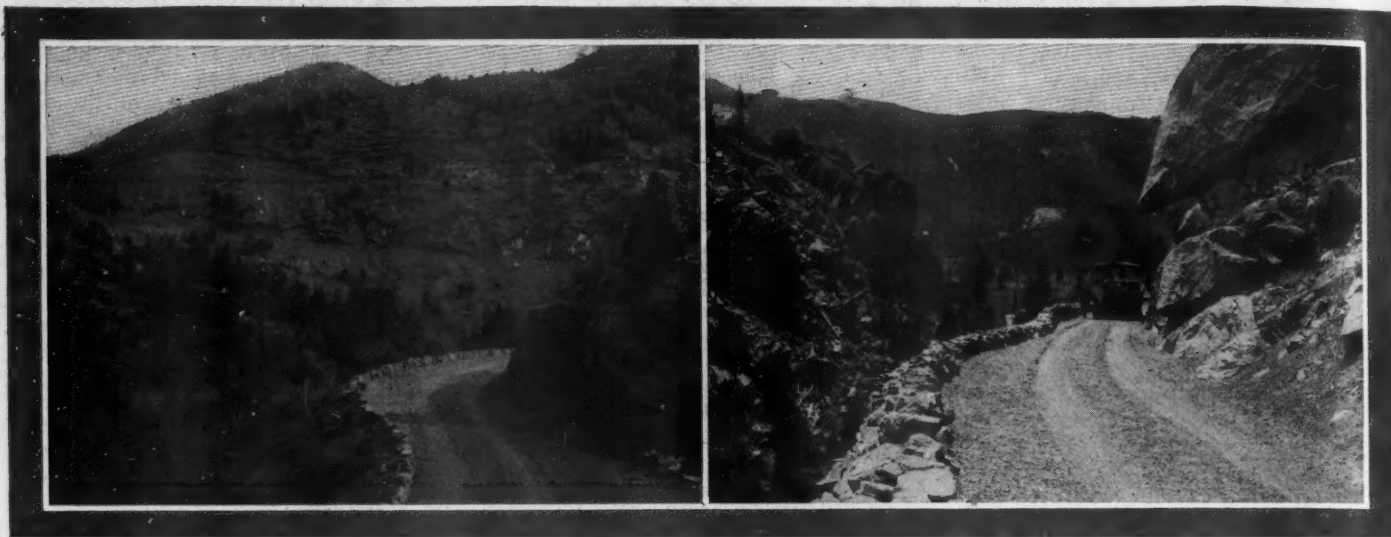
From Mt. Carmel to Mt. Vernon there is only one good road, which is by way of Albion, and from Mt. Vernon the most direct route lies 63 miles through Waltonville, Sheller, Tamora, Puckneyville, Conant, Cutler, Percy, Steeleville, Randolph, and Chester. Cross into Missouri and continue through Claryville, Lithium,



ROCK FORMATION AT CRYSTAL PARK, COLO.



MOTOR CAR ROAD TO CRYSTAL PARK HAVING ELEVEN ELEVATIONS IN LESS THAN 30 ACRES OF MOUNTAIN SIDE



VIEW OF CAR ON WINDING ROAD TO CRYSTAL PARK. GATEWAY TO PARK WITH SNOWFLOW ROCK IN FOREGROUND

Perryville, Jackson, Allenville, Aquilla, Campbell, St. Francis, Ark., Piggott, Rector, Marmaduke, Paragould, Jonesboro, Cash, Pitts, Gubbs, and Newport. The following towns apply en route for Little Rock; Bradford, Russell, Bald Knob, Judsola, Searcy, Beebee, Ward, Gabot, McAlmont.

Mostly good gravel roads are found en route for Hot Springs, 54 miles, through Collegeville, Benton, Fairplay, Lonesdale, Epps. Continue through Lawrence, Social Hill, Friendship, Arkadelphia, Dobyville, Okolona, Boughton, Prescott, Emmet, Hope, Fulton, Homan and Texarkana.

The best road to Houston from Texar-

kana lies first to Dallas through New Boston, De Kalb, Clarksville, Paris, Honey Grove, Bonham, Whitewright, Sedalia, Melissa, McKinney, Plano, Dallas, being 217 miles; between Dallas and Houston the itinerary lies through Lancaster, Red Oak, Waxahachie, Ennis, Corsicana, Mexia, Groesbeck, Marlin, Bremond, Franklin, Wheelock, Bryan, Anderson, Navasota, Hemstead, Waller, and Hockley.

In going from Mt. Carmel to Red Wing, Minn., cross the Wabash river to Princeton and go through Patoka, Hazelton and St. Thomas to Vincennes. Princeton to Vincennes is 26 miles and to Terre Haute 63 miles through Bruceville, Oaktown, Paxton, Sullivan. Terre Haute to LaFayette is 84 miles over good roads through Atherton, Mecca, Rockville, Judson, Waveland, Crawfordsville, Romney, Elston, LaFayette.

To reach Chicago, 133 miles, the popular road lies through Montmorenci, Wolcott, Remington, Rensselaer, Aix, Virgie, Thayer, Shelby, Crown Point, Scherer-ville, Highlands, Hessville, Gibson, Grasselli, East Chicago, Whiting, South Chicago, Bryn Mawr, Jackson Park, Chicago.

Routing to Lake Geneva takes you 82 miles through Oak Park, Addison, Ontarioville, Elgin, Algonquin, Ridgfield, Greenwood, Hebron, and Lake Geneva; Lake Geneva to Madison, 78 miles, is Delavan, Emerald Grove, Janesville, Edgerton, Staunton, McFarland, Madison. A day can be consumed in getting to La Crosse, 146 miles, routing through Ashton, Sauk City, Prairie du Sac, Baraboo, Abelmans, Reedsburg, Laval, Woneewoc, Union Center, Elroy, Kendalls, Cashton, Portland, Middle Ridge, Newburg, Corners, and La Crosse. Do not fail to take in Kilbourn, better known as the Dells of Wisconsin, which is a round trip of about 27 miles from Baraboo and reached through Lyons and Delton.

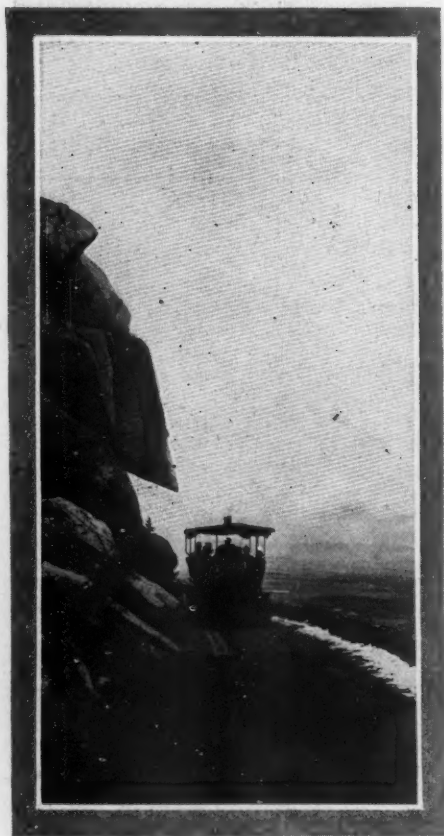
A route which offers the best roads and of course the longer lies through Crescent, Minn., Ridgeway, Witoka, Wilson, Lewiston, Utica, St. Charles, Dover, Chester,

Rochester, Pine Island, Zumbrota, Zumbro Falls, Lake City and Frontenac to Red Wing.

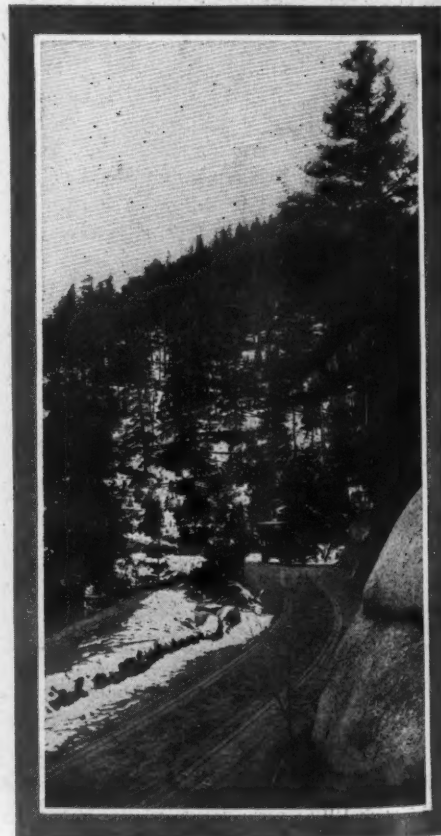
The shorter route is the more scenic and advisable if after careful inquiry at Witoka and Winona, road conditions are found favorable. You will thence proceed along the river through Rolling Stone, Minneiska, Kellogg and Wabasha, Lake City. On this latter road, there is a sandy stretch between Minnieska and Kellogg, and Frontenac and Red Wing.

ADRIAN TO FORT WAYNE

Jasper, Mich.—Editor Motor Age—I would like a route from Adrian, Mich., to Decatur, Ill., via Dayton, Ohio, and



SNOWFLOW ROCK ON CRYSTAL PARK ROAD



LAST STRETCH OF UPPER GRADE TO PARK

return through Ft. Wayne, Ind.?—Tourist.

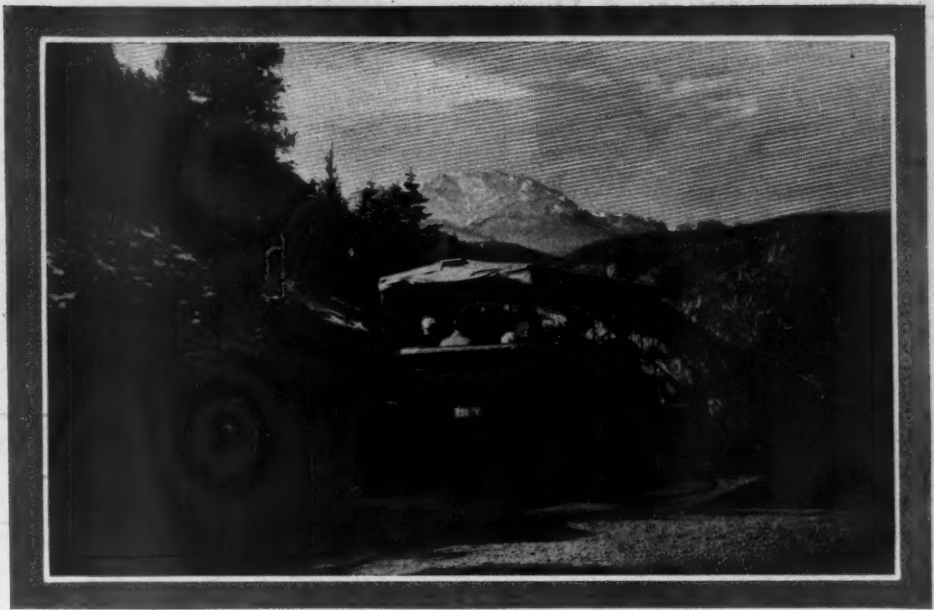
Route to Lima through Madison, Jasper, Lyons, Winameg, Ottokee, Wauseon, Napoleon, Defiance, Lima. If you want to go by way of Toledo from Wauseon the routing is Delta, Crissey, Toledo, Waterville, Haskins, Bowling Green, Findlay, Mt. Cory, Bluffton and Lima, which of course is considerably longer.

A good gravel or macadam road takes you to Dayton, a distance of 77 miles, through Cridersville, Wapakoneta, Botkins, Sidney, Piqua, Troy, Vandalia and Dayton.

Indianapolis is reached through Kingsville, New Lebanon, West Alexandria, Eaton, Westville, Richmond, Centerville, Germantown, Cambridge City, Strawn, Dunreith, Ogden, Knightstown, Cleveland, Greenfield, Cumberland, Indianapolis.

A very good road extends through Crawfordsville and Champaign, the intermediate towns being Clement, Brownsburg, Liston, Jamestown, New Ross, Crawfordsville, Waynetown, Hillsboro, Veedersburg, Covington, Danville, Homer, Urbana, Champaign, Monticello and Decatur.

For the return trip go to Champaign and then Urbana, Danville, Covington, Stone Bluff, Attica, Shadeland, Elston,



TURNTABLE FOR MOTOR CARS ON MOUNTAIN ROAD TO CRYSTAL PARK

Lafayette. A good gravel road to Fort Wayne, 134 miles, is through Buck Creek, Americus, Delphi, Camden, Deer Creek, Logansport, Peru, Wabash, Huntington and Fort Wayne; and the home stretch is Maysville, Hicksville, Defiance, Okalona, Napoleon, Wauseon, Ottokee, Winameg, Lyons, Jasper and Madison.



THE SKY LINE IS THE GATEWAY TO CRYSTAL PARK, REACHED AFTER NUMEROUS TURNS AND SWITCHBACKS ON EXCLUSIVE MOTOR CAR ROAD

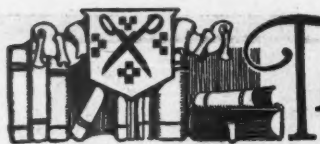
Status of Friction Drive

Efficiencies and Deficiencies of Transmission Types Discussed for an Inquisitive Buyer

AUGUSTA, Ill.—Editor Motor Age—I am thinking somewhat of purchasing a car. Have the merits and demerits of friction transmission been discussed recently in the columns of Motor Age?—J. G. Whetstone.

The claimed merits of the friction type are: unlimited range of gear change, ease of operation, variable friction, simplicity, fool-proof qualities, and silence. The features of this type that have received the most criticism are: great end thrust necessary to obtain the required amount of friction, the necessity of using chain drive, the reverse action of the friction pedal to the usual clutch pedal, frictional losses in transmission, lack of direct drive on high, cumbersome size and location.

That the first advantage is of undoubted value is to be seen in the present agitation for four-speed sliding gearsets, in the contention that three are not enough. That the second also is a feature of importance is evidenced by the emphatic opposition of many drivers to this change on the grounds that the four-speed gearset is too complicated and hard to manipulate. Variable friction is of some value, as with very light friction a car with this form of drive is unquestionably the easiest to handle in traffic. Here might also be mentioned the ease with which the friction car may be reversed for turning, or quick maneuvering in crowded streets. The advantages of simplicity in itself are self-evident. That the friction type is foolproof is not to be doubted, although this type is as susceptible to expert operation as any, and so handled, will show increased efficiency. Its silence is an indis-



The Readers

Discussion of Relative Merits of Friction and Sliding Gear Drive Systems—Good Suggestion Made for Body Alterations for Extended Country Touring

putable advantage in favor of the friction type over the sliding gear.

But all good things have faults. The faults most glaring in the present development of the friction transmission are: Due to the small area of adhesion A, in Fig 1, great pressure must be exerted to bring the friction surfaces together. This pressure falls on the bearings at B1, B2 and B3. In recent developments, thrust bearings of the ball type have been placed at B1, and annular ball bearings at B2 and B3, which serve to neutralize this to some degree; but the pressure still exists as an inherent disadvantage of this system. Various attempts have been made to lessen this fault by using a multiplicity of disks and wheels, but these have not been, so far, applied to pleasure vehicles; with one or two exceptions, in cars no longer manufactured. Such applications of the friction principle have been made on commercial cars, where the conditions of service made the increase of friction area inevitable, but such devices are of such cumbersome and bulky nature as to preclude their use on pleasure vehicles. In view of the popular preference for shaft drives, due to their silence and cleanliness, the chain drive necessitated by the disk and wheel type of transmission is to be considered, from a mercantile standpoint, a

drawback to this type, although with the silent chains and chains in oil used commonly with this type, there is no real foundation for this prejudice. The usual order of pressure on the pedal to release the clutch and release of pressure to engage it, used on sliding gear cars, is reversed in the friction type, a ratchet pedal being pressed forward to engage the friction, the pressure being variable, and the pedal locking at each position, it being necessary to touch it with the toe to release it and unclutch the engine from the drive wheels. This is awkward for the driver of gear-driven cars, but when once accustomed to this arrangement, no trouble is experienced.

It is true that on high gear the direct drive of the gear type has an economical advantage over the friction type, and that owing to the fact that the disk and wheel contact is not a true rolling contact, power losses on its lower gears are great. This objection is met with the fact that owing to the limitation to three or four steps of ratio, the adaptability of the gear drive to any certain load condition, is at best but approximate, as the gear ratio required for any two conditions is seldom the same; while the thousand speeds of the friction drive permit a skilful driver to select the exact ratio required by every change in the conditions of running. This is borne out by the difficult feats in the way of hill climbs, stair climbs and negotiations of curbs and ditches by the demonstrators of cars using this type of transmission. But the fact remains that direct drive with this type is unattainable, and as most of the driving is done on direct, with gear drive, the charge against the friction type in this particular is grave.

In regard to the shape, size and position of the friction transmission, this is perhaps the chief drawback to its use. It takes up a large amount of room, as its efficiency depends to a large measure on its size. It must be mounted amidships of the chassis, and for this reason it is put under the front seat, preventing the use of this space for stowage. Its excessive diameter, too, obligates the designer to carry his body rather high in order to keep his seats low enough for comfort and yet maintain sufficient clearance.

This problem has been discussed pro and con for many years by the leading motor

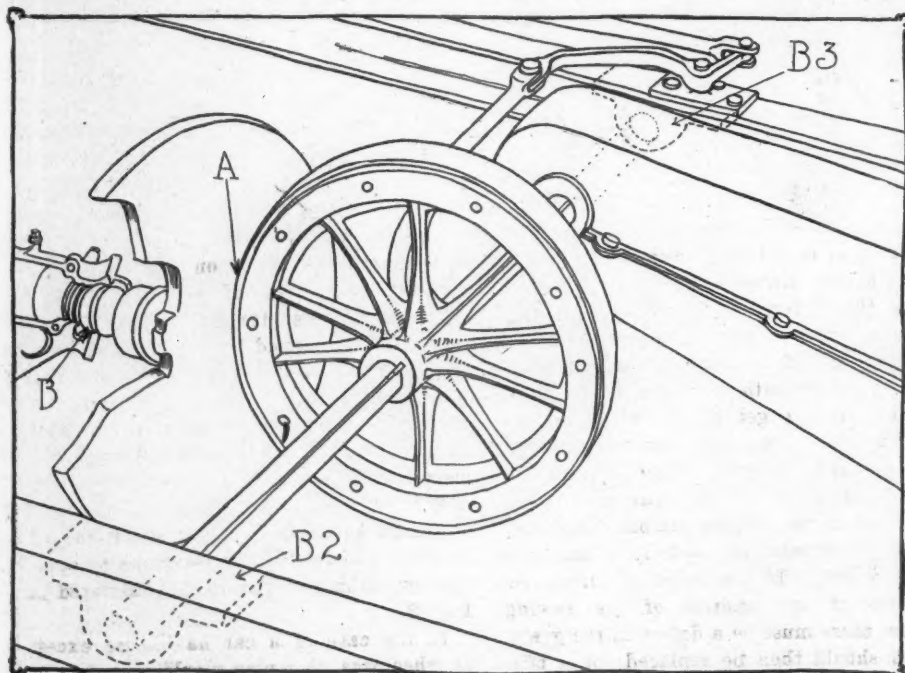


FIG. 1—AREA OF FRICTION AND POINTS OF THRUST ON FRICTION DRIVE

Clearing House



Many Reasons Why Motors Overheat—Should Decarbonize Weekly—Carpenter Describes Ideal Tool Equipment—Police Chief Amends Mistaken Statement



engineers, but with no apparent agreement, and it seems certain that there is much merit in this principle of drive. The forms that have been applied to motor cars have been reported as very successful; but the complete solution of the transmission problem is yet to be made. This type of design is in many ways analogous with air cooling, the two-stroke cycle, and front-wheel drive, alike based on uncontroversially sound principles, but each tried and abandoned by the majority of designers for the standard practice in their respective fields. Whether some day a renaissance in motor car design will revive these features and place them on the dias of standard design, remains to be seen.

OVERHEATING CAUSES LEGION

Memphis, Tex.—Editor Motor Age—1—How does one connect the batteries and magneto of a 1909 Cadillac on the magneto coil, doing away with the battery timer and coils?

2—Why does my 1911 Ford heat to the boiling point when it runs about 2 miles? When I cut down the fuel it has no power. I have tried it with the spark lever at all positions, but to no effect, and when I cut down the fuel, as stated above, it has no power. I have just given it a thorough overhauling. Is the trouble caused by the carbureter?

3—Why cannot I get the noise out of on E-M-F differential, or drive pinion and bevel gear. I have tried adjustments, but to no effect.—C. E. Rawlins.

1—The Cadillac company did not intend that the car should be wired in this way, and strongly advise against it. It may be done, however, if a Remy low-tension magneto with a non-vibrating coil is used, by wiring the battery to the magneto distributor, inducing the current in the non-vibrating coil. This will do away with the timer and vibrating coil, but why these members should be eliminated is not clear. It is certain that a coil intended for a magneto current is poorly adapted for use in connection with batteries. With any other than a low-tension Remy, or a specially built Splitdorf, designed especially for such use, this may not be done, and the advice of Motor Age is to follow the advice of the maker as to changes of this nature.

2—There are almost as many possible causes for overheating in any motor car as there are parts to the motor. With no more

definite information than is given in the question, Motor Age cannot do more than enumerate the most frequent causes of overheating in a gasoline engine. Assuming that the cooling system is in good repair, and that it is kept full of water, that circulation in all portions of the radiator and jackets is complete, and that the passages are kept clean and free of scale, the most common cause of cooling trouble is poor carbureter adjustment. The carbureter should not be blamed, however, until it is definitely ascertained that the trouble cannot lie elsewhere. This being established as certain, the carbureter should be adjusted to run the engine with the minimum of mixture density, i. e., as lean as possible. If the carbureter is correctly designed and in good repair, correct adjustment in this direction should cause the motor to deliver its maximum power. If, on the contrary, it shows a loss of power, when the mixture is thinned, the trouble is with the carbureter itself, rather than its adjustment. See that the float is in proper order; that the needle valve seats properly, and that the air valve opens as it should.

Before touching the carbureter, however, the spark timing should be inspected. See that it advances correctly, and observe in your driving whether or not you are carrying it sufficiently advanced. Examine your lubrication, remembering that a little smoke in the exhaust is better than a hot motor, and decarbonization is an easier and cheaper repair than that of a siezed piston or a burned-out bearing.

3—Before attempting to eliminate noise in the rear axle gears, the location of the sound should always be determined. If it is in the differential it will occur only when rounding a curve or when one wheel is slipping. If it occurs at all times of running, it is either in the bearings or in the driving gears. It is, of course, superfluous to suggest that the lubrication be made sure of. There is but one adjustment on the E-M-F rear axle assembly, that of the driving pinion. This may be moved forward or back by means of a screw collar. If the noise continues regardless of any position of the driving pinion, there must be a defect in the gears, which should then be replaced; or a misalignment, which should be taken care of by a competent expert. The best plan, in this case, is to send it to the factory.

Design for Motor Pullman Western Motorist Outlines Design for Touring Car Independent of Hotel Accommodations

OKLAHOMA City, Okla.—Editor Motor Age—I have endeavored to find some design for a touring and camping body for the motor car that would not add weight or bulk, yet have the convenience so desired by the camping and touring public; a car so arranged that the home comforts can be had within the body, avoiding the carrying of tents, camp chairs, camp beds, and the frequent necessity of living upon the damp ground while enjoying the wild woodlands near some remote lake or stream. I enclose a rough sketch of a body for consideration.

The above sketches are aimed to outline a body extending over the trunk racks as they are now in use, the lower part thus enclosed to be used as a clothes closet, the upper portion for a gasoline stove and utensils, the seats to be as usual but the backs to drop back to the level of the seats, thus forming a bed similar to a pullman berth, all cushions removable for convenience of the room.—B. R. Harrington.

In Fig. 3 is shown an elaboration of Mr. Harrington's sketches which to some extent conveys his idea with Motor Age's suggestions added. Sketch 2, illustrates the appearance of the interior of the car ready for the road, the combined wardrobe and kitchen occupying a space behind the rear seat. The front seat is arranged so that its back may be tipped backward, the back of the seat having a slot in it of the shape indicated in sketch 1. To lower the back of the front seat first press down on the back to release the pin in the slot shown in 1; then raise the back until the pin slips into the end of the slot and then lower the back until it rests on the rear seat. The back of the front seat travels on a pin protruding from either side of the body, the head of which is inserted in a slot. This pin locks at either position by slipping into the end of the slot. The back of the rear seat lifts up and can be placed on the top of the rearward extension of the body which forms the kitchenette and wardrobe.

The bed is formed by the front cushion, the back of the front seat, and the rear cushion as shown in 4. Entrance to the kitchenette is given by placing the back and cushion of the rear seat on top as shown in 5, and then lifting up the rear seat boards which are hinged at one side. The shelf in the back is cut away enough to allow the door of the wardrobe to open. The appearance of the car is illustrated in Fig. 2.

In the case of a car having no excess of wheelbase, this plan would probably be the best, as the construction shown in Fig. 2, if adapted to any but a long wheelbase, would involve much unsightly

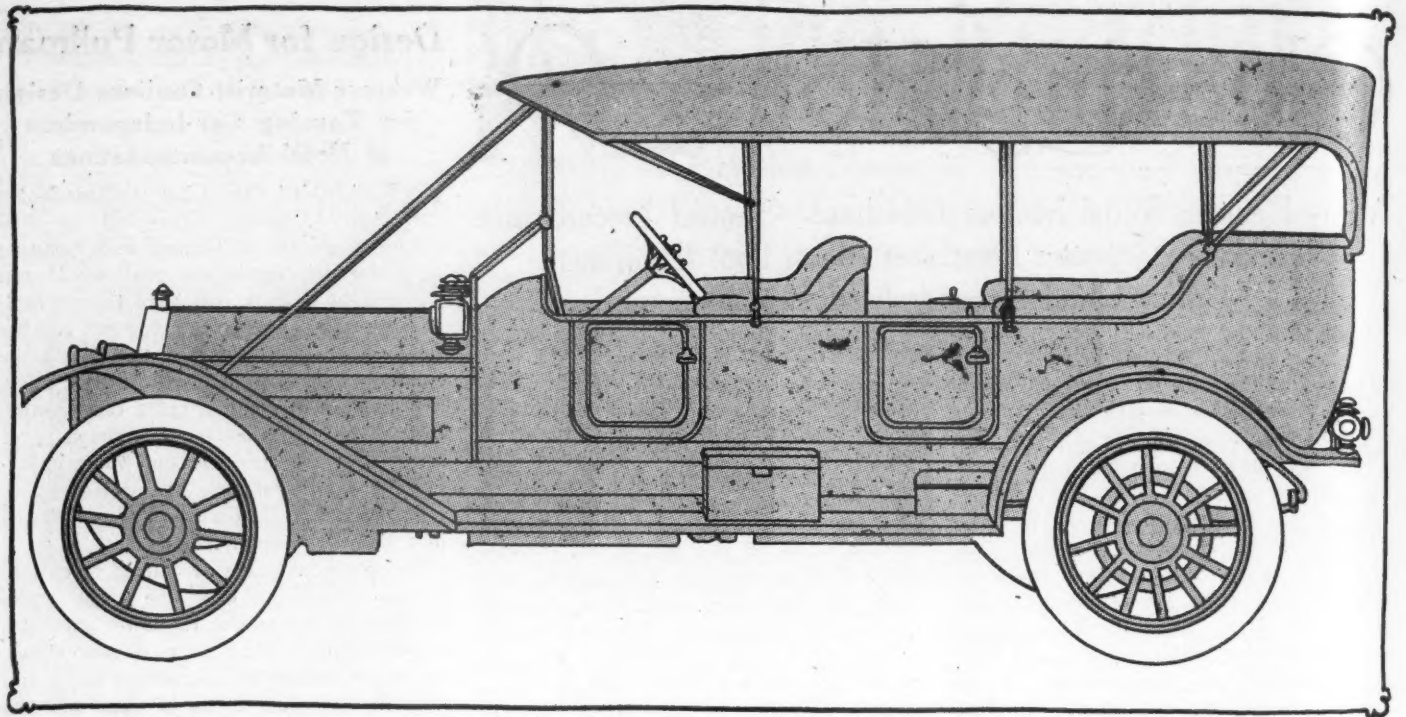


FIG. 2—DESIGN BY MOTOR AGE FROM B. R. HARRINGTON'S SUGGESTION FOR CAMPING BODY

overhang, that with a dummy touring trunk would not have as awkward an appearance.

MEANING OF FACE DIAMETER

Nyack, N. Y.—Editor Motor Age—In Motor Age of November 16, 1911, is given a description of the engines of the Sizaire-Naudin and Hispano-Suiza cars.

If it is desired the rear extension, housing the stove and wardrobe make be made to have the shape of touring trunk; this latter arrangement could be used easily in refitting an old body in this way.

In this description it is stated that the face diameters of the valves are respectively 55 and 60 millimeters. I would like to know whether by face diameter, is meant the clear diameter or the large diameter, as I have never seen the expression face diameter used in giving valve dimensions.

I hope Motor Age will publish more descriptions of high-efficiency motors for light foreign cars, as I consider their design to contain many details which will be incorporated in larger cars of the future. —Edward G. Ingram.

The face of a valve is the surface next the interior of the cylinder. The face diameter is the diameter of the beveled openings in which the valve seats, that portion of the valve, which is encompassed by this opening, being the face.

VIBRATOR EXHAUSTS BATTERIES

Martin, Mich.—Editor Motor Age—I have an Overland 59-T, and have had three sets of batteries since April and cannot find the shortage. I do not run on the batteries and cannot start when they run down to 5 amperes or less, neither can I start on magneto. After pressing the switch so that it would rub tighter I could start on magneto.—L. H. Bender.

1—Your trouble is in all likelihood with the adjustment of your vibrator. It is probably adjusted too stiff, so that it consumes an excessive amount of current, and will only act when your batteries are in good condition, the strength of a 5-ampere current being too little to overcome the resistance of the spring. The vibrator should be adjusted as soft as possible for economical running and easy starting. While adjusting this part, it is always well to make sure of the condition of your platinum points. There may be a short circuit in the switch if the vibrator is not at fault.

TOOL KIT FOR TOURING

Sauk Center, Minn.—Editor Motor Age—I will give a list of the articles which 8 years of experience has taught me that I must, to avoid mind-worry and possible loss of the higher realms of pleasure after death, carry in the tool box of my car, I now hear some one say: "What an old fudge." This kit, however, has saved me ten times its cost, which is quite large, and I never have been pulled in since I sold the big freight-car some years ago.

Here is what I have in one box: One big monkey wrench, one small monkey wrench, one adjustable off-set wrench, one Elgin wrench, three S wrenches with different size openings; a set of socket wrenches with universal joint and ratchet handle, one jack, one small riveting hammer, one ball-peen hammer, two cold chisels, four punches of different sizes; one pair of pliers, one cutting nipper, five extra spark plugs, three tire tools, one clamp, one flat file, one triangular file, one round file, piece of asbestos, one valve lifter-spring, twelve extra insides for inner tube valves, one box cotter pins, one box assorted nuts, one box assorted rivets, six assorted taper pins, one pump assortment

steel balls of the kind used in car, small coil of best annealed steel wire, a spark plug wrench, a coil of insulated primary wire; one piece of sandpaper, some waste, extra wire belting for pump, small jeweler's file, one box of assorted cap screws, a few assorted sized bolts, a piece of harness leather, one can flake graphite, valve grounding compound, a few assorted nails, a strip of belt lacing, small screws, funnel, tire gauge and a strainer for gasoline.

In my next box away from these articles spoken of, are to be found properly placed to avoid damage, three inner tubes, two blow-out patches, four outside leather sleeves, one steel linked outside tire clasp, one package French chalk, one voltmeter and one ammeter, chamois skin, some cotton cloth, one bottle diluted carbolic acid for cuts or bruises on hands. In my next compartment are an extra storage battery, fully charged; a can of grease, one can of lubricating oil, one can of gasoline. These go to make up a very complete set or kit of tools, etc., which makes your trip much more pleasant and care-free, and behind it many bright dollars. I can almost assemble a motor car with this outfit, and many times in helping some thoughtless motorist I have taken a plunge right into this outfit and brought forth just the thing he wanted.—A. D. Carpenter.

HOW OFTEN TO DECARBONIZE

Jasper, Mich.—Editor Motor Age—How often should carbon be removed from an engine? I mean in regard to the number of miles.

2—Will kerosene, if put in the cylinders over night, be of any real value as a carbon remover without the use of scrapers made for that purpose? If so, is there any need to drain the crankcase of cylinder oil to keep the kerosene from

mixing with it by soaking down past the piston rings?—Tourist.

1—On an average machine, in use on an average of 30 miles per day, the cylinders should be cleaned out with kerosene once a week, or every 200 miles of running.

2—If kerosene is put in the cylinders at night and the motor turned over several times to get the oil well spread over the surface, it should be left over night, and the motor run next morning to burn it out. The exhaust will be very smoky until the kerosene and carbon have been burned. The oil should be drained out of the crankcase after each decarbonization.

BRASS POLISH FOR MOTOR CARS

Detroit, Mich.—Editor Motor Age—Please give me a recipe for a good brass polish.—E. C. Walson.

A polish that is easily compounded at home is made in the form of a paste of equal parts of sulphur and chalk, with sufficient vinegar to reduce it to the required consistency; apply it with a soft cloth, while moist, rubbing it off and polishing, when dry, with a piece of chamois. This is but one of many, being recommended for its simplicity.

A more complicated formula is: 80 per cent alcohol, 100 parts; olien, 50 parts; tartaric acid, 80 parts; tripoli, 30 parts. Mix the tartaric acid—in powdered form—with the alcohol, whereby the acid is partially dissolved, then add the olien, and finally the tripoli, taking care to mix thoroughly.

There are many more formulæ for this class of polish, but the above will give very good satisfaction.

POLICE CHIEF MISQUOTED

Atlantic City, N. J.—Editor Motor Age—In the article on "Traffic Rules for Smaller Cities," in Motor Age for August

8, I am quoted as being the only one to vote against the rule of slow-moving vehicles keeping to right curb. That was a mistake made by the clerk evidently, as I never was in doubt but what that is one of the most necessary rules. I think the Kansas City ordinance good. But some of its regulations would be unnecessary here. I think you are doing a good thing by trying to get as near uniform regulations as possible all over the country.—M. B. Woodruff, chief of police.

FORD TROUBLES EASILY REMEDIED

Sturgeon, Mo.—Editor Motor Age—I have the care of 1910 and 1911 model T Fords. Last summer the 1910 model was run dry and three bearings were burned out. Since then it has been using a great quantity of oil. After running 4 or 5 miles the engine misses. If the plugs are cleaned it will then run well for only a short time. The compression seems good and it has plenty of power so long as it runs on all four cylinders. This model has a partition between the magneto and the crankcase. If this partition were taken out would it stop the use of so much oil? If not, will Motor Age suggest a remedy?

2—In the 1911 model the motor begins bucking if the car is slowed down to 7 miles an hour on high. Last summer I had a Kingston carbureter on it. It now has a Holley carbureter and the valves have been ground and the engine given a general cleaning. After that it ran well, especially on the magneto which it had not done before; it would run 5 miles an hour on high and never buck. When the gasoline tank was filled another grade was used and now it will not run good at all. If the spark control is set in the fourth or fifth notch it runs all right, but if moved out of the notches it will shoot like a blank cartridge pistol and then stop. This stopping

occurs only when it is running on the magneto. If it is switched on to the batteries the spark may be pulled out of the notches and the motor will still run. Will Motor Age tell me what is the cause of this stopping and state a remedy for it?

3—Is there any preparation on the market to put on faded top linings?—James Lile.

1—Cut out the partition and the spoons on the lower ends of the connecting rods entirely, then carry your oil level as high as possible without smoking. It may be necessary to carry this level as high as the upper pet cock of the crankcase. This is the only remedy Motor Age can suggest if the cylinders, pistons, and piston rings are in good condition. If not, the defective parts should be repaired or replaced.

2—The first trouble is evidently with the gasoline. Have it strained through a chamois, to exclude water and foreign substances. Your carbureter probably is adjusted for a higher grade of fuel than you now use. The second trouble in all likelihood is the result of a short circuit in the commutator wiring, which is the result of bare or damaged points on the insulation, which touch on all spark positions but the one to which you refer. That such a fault has not been before discovered is due to the fact that it is not a direct short circuit, there being probably a layer of dry or oil-soaked insulation to deceive the observer, which exerts a sufficient resistance to prevent serious leakage of the relatively weak battery current, but cannot contain the magneto current. Renew these wires and your trouble will probably cease.

3—There are several preparations on the accessory market of this character, although any water stain will do the work. One of them is made by the Rub-On Varnish Co., Buffalo, N. Y.

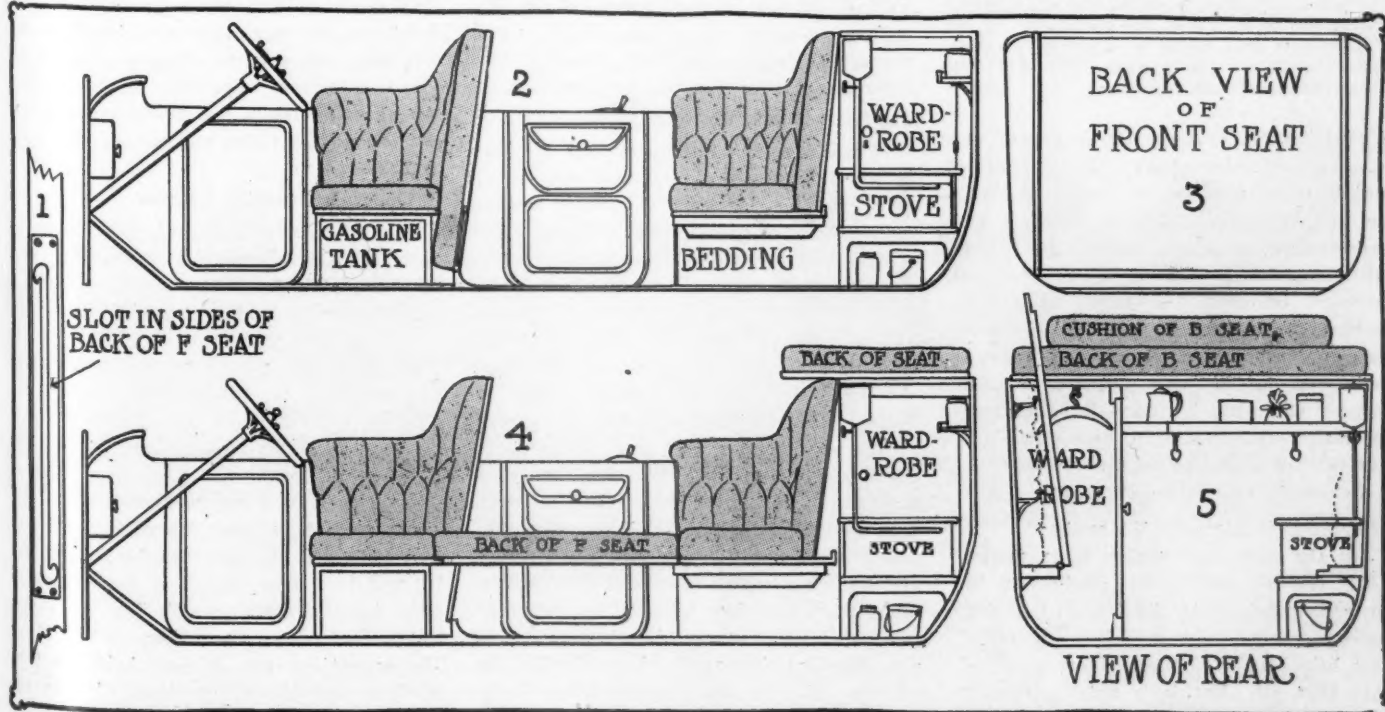


FIG. 3—SECTIONS SHOWING INTERIOR ARRANGEMENTS AND CONSTRUCTION OF CAMPING-TOURING BODY

Jig Is Carbureter Makers' Trump Card



FIG. 1—CARBURETER BODY JIG

This jig is an irregular six-sided metal framework to hold the casting, which is anchored by the piece L. The jig serves for six different operations, all of which are carried out by the eight-spindle drill, which is in reality two four-spindle drills coupled together. The drill D is shown in one drilling operation.

PRODUCTION is the battle cry of carbureter makers today. The carbureter maker must produce in hundreds daily, one maker producing 500, another perhaps 800 and another 1200 or more. They all manufacture for high-tensioned car builders, builders who must have their carbureters on time at any cost. One car maker refuses to use a certain make of carbureter on his cars because he must have a shipment by noon Saturday and the maker cannot supply them until Monday morning. A day is a short time but it is enough to change an order.

Production Uniformity Necessity

But the carbureter maker is up against other factors than mere production, he can accomplish that. Additional buildings can be erected, new machinery installed, more help hired and the problem is solved, were that all. But it is not: uniformity in production is the big goal to be aimed at. Carbureter parts must be inter-

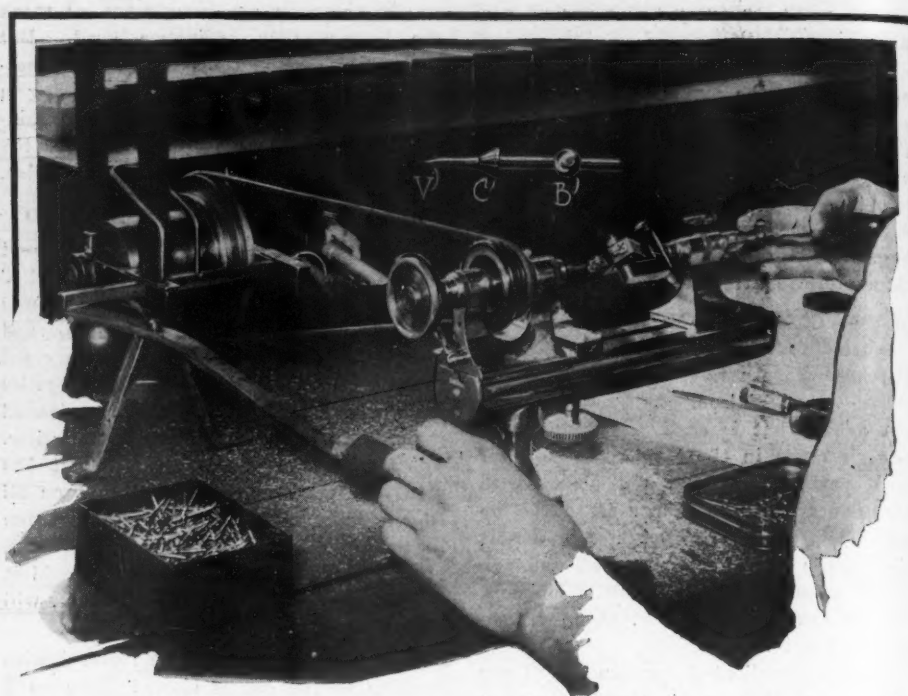


FIG. 2—WATCHMAKER'S LATHE IN CARBURETER WORK

This lathe is used to turn the point V of the gasoline needle valve, shown in actual size in the upper part of the figure. The alloy steel cone C is ground and is the only ground part in the carbureter.

Great Mechanical Precision in Manufacture of Parts and Uniformity of Production Attained Through Use of Templet —Process Employed by Wheeler & Schebler

changeable, in a word, they must be standardized. The part that fits one carbureter must fit equally well any of the 1,000 others that are produced the same day, any of the 6,000 others produced the preceding week or any of the 25,000 others manufactured the previous month. This interchangeability is the big problem.

Jig Secures Interchangeability

In manufacturing there is only one way to get interchangeability and that is by using the jig. The jig is applied science in the hands of the ordinary artisan. Give a carbureter bowl or float chamber to a workman and ask him to drill six holes in it at different parts, in different directions and of different sizes. Set another workman at the same job with another float chamber; do likewise with a third, a fourth, a fifth, a sixth and etc. What will be the result? Not any two will measure the hole location with the same degree of accuracy. Not any two of the six holes will be drilled exactly alike by the different workmen. When such carbureters are being assembled they will not go into place properly, they will not be properly assembled and when sold they will not give that performance they should. It will cost the manufacturers more to keep his customers pleased than to make carbureters properly.

The jig makes it possible to manufacture so that all parts in 100,000 different carbureters will be interchangeable. The jig makes it possible to hire a new man Monday morning and have him do as good work as the workman who has been on the job for several seasons. With the jig it is almost impossible to do a thing wrongly. With a jig there is only one way to do the thing and that is the right way.

Wheeler & Schebler Process

Fig. 1 shows a workman using a jig in the Wheeler & Schebler carbureter factory at Indianapolis. The jig is the irregular-shaped metal frame work J in which the carbureter body part is placed. The carbureter part slips readily into it and when in is locked therein by a set plug L. A turn or so of this forces it down on the carbureter part, locking it. If the carbureter part is not properly in place in the jig it will not lock it so that the workman cannot err. There is only one way in which the part can be put in the jig and he learns that in a few minutes. This jig is known as the big body jig and is used for six operations on this part. The operations are drilling holes in the castings and threading them. Wherever a hole has to be drilled in the casting there is a hole in the jig and it will be

seen that the drill D is boring or drilling a hole in the casting as indicated by the dotted lines, this hole being where the needle valve in the nozzle works. There is in the top of the jig a hole through which the drill D passes. This hole is bushed with a hardened steel bushing, the correct size for the drill D. A larger drill would not enter, a smaller drill would not work properly, thus there is only one and that the right one. All the workman has to do is place the jig on the base of his machine, do this with the left hand, and bring the drill D into operation with the right hand. He cannot do it otherwise than the right way.

Operation of Big Body Jig

When this hole is drilled he slides the jig with its casting along to the next spindle at his right, turning the jig over to another bushed hole and drills or taps the other holes as needed. Thus the workman goes from one end to the other of his eight-spindle drill and performs in all six different operations on this part without making a single error or having to use a rule or calipers or anything else to measure where the holes should be drilled. The jig does it all for him and prevents him making errors. A single workman with such a machine will handle hundreds of castings of this nature per day, his capacity as a factor in carbureter production is readily seen. The six operations are drilling and tapping.

Fig. 3 shows another jig J in which the piece P is anchored, almost hidden inside the jig but reproduced outside the jig at the lower left to show its shape and appearance before being put in the jig. This piece is the cam for varying the lift of the needle valve with different throttle positions. Eight operations are done on this while it is in the jig. It has holes drilled in it, it has these holes reamed out or made smooth and it has some of them tapped or threads cut on them. The drill is shown at H2 cutting one hole; at H1

is a bushed hole where another hole will have to be drilled; W is for anchoring the part P in position.

Fig. 4 gives an excellent example of jig work in the Schebler plant. Here are five different jigs, each having inside it the piece to be worked upon, and each having in front of it the piece before it was put through the jiggling operations and also the piece after put through the jiggling operations. In part No. 1 is the float lever having had two operations, drilling at 1 and also at 2. In the jig are two holes where the drill enters for these operations.

At part No. 2 is the throttle lever jig, with the throttle lever part in it. The pieces in front show the two drilled holes 3 and 4, holes at right angles to each other, to do which the workman must turn the jig on his machine. The bushed opening for drilling the hole 3 is seen in the near side of the jig.

Part No. 3 shows the flushing lever bracket which has two holes 5 and 6 drilled in it and then reamed, making four operations in all. These holes are at right angles, calling for turning the jig by the workman between operations.

In part No. 4 is the cam casting jig already referred to and illustrated in Fig. 3. The four holes to be drilled are designated 7, 8, 9 and 10. There are in all eight operations, as each hole has to be reamed after being drilled.

Hinged Type of Jig

Part No. 5 shows a different type of jig and one in common use in factories, namely, hinged type, it being necessary to hinge one part in order to get the piece properly anchored inside it. The hinged top is shown thrown back to the right exposing the curved top of the needle valve lift lever. Six operations are done on this part, drilling three holes 11, 12 and 13 and reaming them out, reaming leaving them with a smooth finish. These three holes are all at different angles, it

would be almost impossible to get them correct unless in a jig in which the workman has not to do any measuring but simply lock the part in place and put under the drills and reamers. The larger finger wheel at the left of the jig is on a short hinged rod and is used to lock the jig door in place, this door only locking when the part to be worked on is in its proper position.

Drilling the Holes

Every hole in the Schebler carbureter is jigged. Every hole that has to be reamed has the reaming done by jig or fixture, which is a simplified jig. All milling operations have special fixtures to hold the piece in position; in the rough foundry work jigs are used everywhere. In a

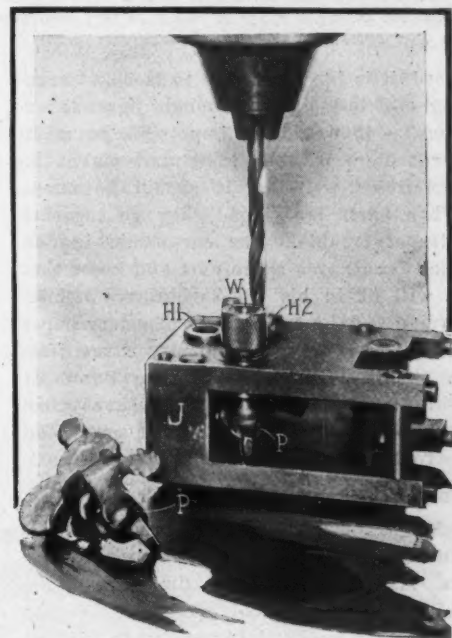


FIG. 3—CAM CASTING JIG

This jig is used for eight operations, drilling, counter boring, reaming and tapping the piece P which is inside the jig is shown at the lower left

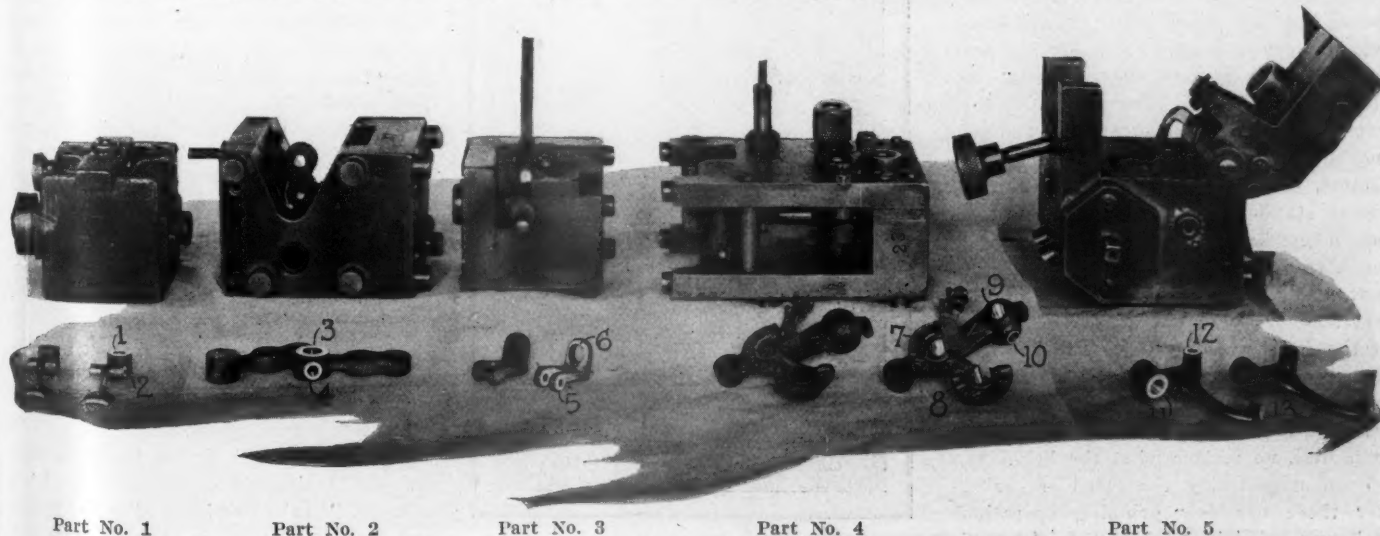


FIG. 4—FIVE TYPICAL JIGS USED IN WHEELER & SCHEBLER CARBURETER FACTORY

Part No. 1 shows the float lever jig with the piece below before being drilled and after drilling at points 1 and 2. Part No. 2 is the throttle lever jig with lever drilled at 3 and 4. Part No. 3 is the flushing lever bracket drilled and reamed at 5 and 6. Part No. 4 is the cam casting jig shown in Fig. 3. It has eight operations. Part No. 5 is the jig for drilling the needle valve lift lever. This jig has a hinged cover, needed in order to get the piece properly held

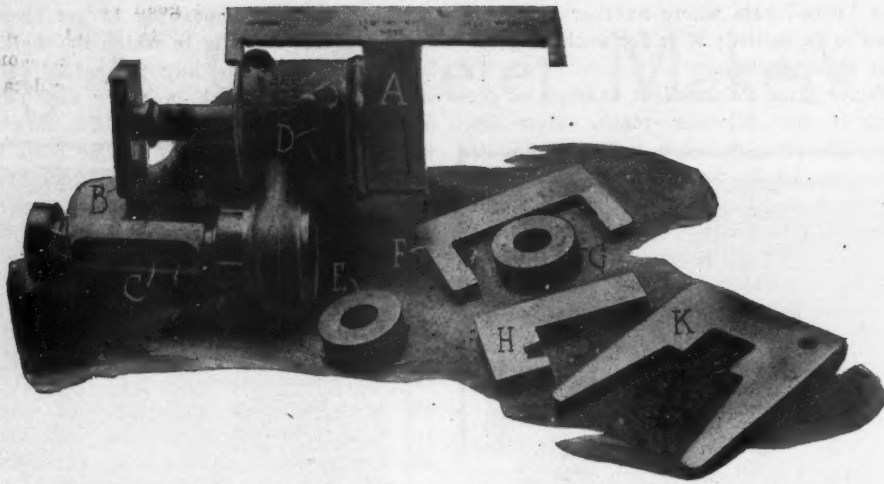


FIG. 5—GAUGES AND OTHER PARTS NEEDED IN INSPECTION DEPARTMENT

This shows gauges A, F, H and K to test accuracy of the carburetor parts when being inspected and also threaded plugs B and C to test accuracy of internal threads, and threaded rings E and G to test external threads on carburetor parts

word, it is jigs from first to last and nothing else but jigs. Although jigs are expensive it would be impossible to make carburetors without them and make the carburetor well—as it should be made. When parts are jugged they go together without trouble. The car owner in San Diego can buy a spare part and know that it will fit in his old carburetor without having to take a file or bit of emery paper to it. The carburetor dealer saves time in the transaction because he knows it will fit properly. Everybody saves time and money and the car owner gets good performance.

Cost of Making Jigs

But jig making costs money. The jig must be specially made for the part and its manufacture calls for high-priced skilled labor. It will take one expert workman 6 weeks at \$4 per day to produce a jig such as any of these illustrated. This represents a salary alone of over \$150 which does not take into consideration the materials used and the tool room equipment necessary to make such a part. Some jigs cost much more than this and when it comes to jigs for many car parts in a big car factory the cost runs into thousands of dollars. But in spite of their expense jigs are economical, they are good investments. They are the owner's protectors. They eliminate faulty work, they insure standardization. Where a factory has a good jig system you know their manufacture is all right. One factory expert said when asked how a certain car was made that he did not see the inside of the factory, he only saw the jigs used. He saw the accuracy of them, he saw the general use of them and he knew that the car's parts could not be made otherwise than well, no matter what the help.

In manufacturing the Schebler carburetor there are few grinding operations such as needed in a motor car. There is only one grinding operation in the carburetor and that is shown in Fig. 2. It consists in grinding the nickel steel cone C on the intake gasoline valve. This is

the valve that is raised and lowered by the float and shuts off and lets flow the gasoline into the float chamber from the tank. This valve is shown in its normal size in the upper center of the illustration and immediately beneath it may be seen in a delicate watchmaker lathe having the small point C properly turned. The ball part B is to give it a universal support.

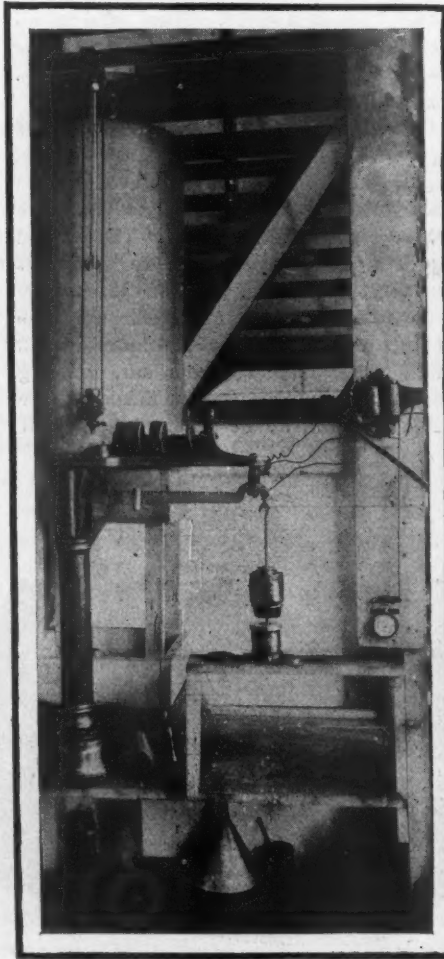


FIG. 6—SCALES TO WEIGH FUEL CONSUMPTION

The scales with fuel tank and electric wiring as electro-magnetic means for shutting off fuel when pre-determined amounts of fuel have been used

This is one of the small carburetor parts and yet one which calls for the utmost accuracy, accuracy only possible by using machines of accuracy sufficient for the finest watch parts. The two grinding machines neither of which is illustrated, have capacity of 800 each per day or a combined daily capacity of 1,600.

But a good manufacturer will go one step further in accuracy and interchangeability of parts. The jugging system is alright but it is followed up by an inspection system. The diameters of the holes drilled are tested; the threads cut to take plugs are tested; the length of a casting is measured; the diameter of a counterboard part is tested, and in short nearly every part is tested. The part must be right and while the jig is supposed to do everything right, it may be there has been a slight blowhole in the casting, which was not visible until a hole was drilled; it may be that the core of a casting has slightly shifted and this could not be detected until several operations were completed; then again a tool may become worn and of smaller diameter. A drill may get under size, so may a reamer or a tap. These are well looked after in the tool room checked up but often slight errors are detected in the inspecting room.

In the Inspection Room

The inspection room is a large table on which the carburetor parts are placed. In Fig. 5 a good conception of the work is given. Here is a carburetor casting D. Over it is slipped the gauge A to see that it is the proper length. A permissible tolerance or variation is allowable but if for any reason it exceeds this the part is discarded. Other gauges F, H and K are used to similarly test the accuracy of other measurements. While these parts are being tested bars B and C threaded on the ends are being screwed into the threaded parts of the casting to see if the threads are properly cut and there are internally threads rings E and G which are screwed over the threaded bosses on the casting. Similarly every carburetor part is taken and inspected before it goes to the assembly room or ever has a chance of finding its way into a carburetor. Only accurate parts reach the assembly tables.

Another example of accuracy of inspection is shown in Fig. 7 in which a workman is shown inspecting the cam K which regulates the lift of the needle valve by the opening and closing of the throttle. The contour of this cam is altered by the two adjustments A and A1. Each is a short screw with a spiral slot into which slot enters a short lip on the cam piece K. By turning the screws A and A1 the cam can be raised or lowered in the spirals and its entire contour changed, thus the regulation of the gasoline feed is assured. To make certain that this cam is correct before being assembled each one is tested with a gauge. When the adjustment is

set right by a screwdriver the cam is swung beneath the gauge finger and the hand or pointer on the gauge shows in greatly magnified reading the exact cam contour at each point. This reading must check up with the standard and until it does so it must be worked on until correct. With such accuracy there is not any difficulty with faulty adjustments and troubles after the carburetor is installed on the car. Other examples of similar accuracy in adjustment and testing could be cited but space will not permit.

The Laboratory Test

Before the carburetor ever reaches the factory, before the castings are made, before the jigs are made; in fact, before it is decided whether it will ever be produced or not it goes through a different type of factory, the laboratory. Here it is that it is tested, that it is given the horsepower test, that it is given the fuel consumption test, in fact, given every conceivable kind of test. It is foolish to begin manufacturing a carburetor before it is mechanically correct, before it gives desired results, etc. The laboratory is for this purpose. Fig. 8 shows the Wheeler & Schebler testing laboratory with a carburetor test in progress. Three men conduct the test: the one at the right is working with the carburetor attached to the motor; in the center the man is taking the horsepower readings on the scale beam of the electric dynamometer which is driven by the gasoline motor; and at the left is the assistant at the switch board regulating the load which the motor has to carry. With such an equipment



FIG. 7—TESTING CAM CONTOUR

By means of a special watch-type of gauge the cam contour is tested for the necessary accuracy. The cam contour is adjusted by the two screws A and A1 in each of which is a spiral slot in which the cam tongue rests

the flexibility of the carburetor can be tested. Any desired load can be thrown on the motor in a fraction of a second and the horsepower readings will show the ability of the carburetor to give the necessary mixture in such an exigency. The motor is run at different speeds and the power curve charted to see how the

power holds up with the changing speeds and if the curve is a good one. In the rear of the workman at the right is the arrangement for measuring the fuel consumption. This is shown in greater detail in Fig. 6. Here the large vertical tank of gasoline is shown with its fuel pipe leading to the carburetor. The scales are connected up with electro-magnetic controls so that when a pound or any weight unit of fuel is consumed the electric control immediately cuts off the supply and the test is stopped. In this way it is possible to determine gasoline consumption per horsepower minute or hour as the case may be. It is possible to determine if the carburetor is using too much fuel at low speeds, at intermediate speeds or at high speeds. With such a testing equipment it is possible to try out the carburetor in every possible way. But this laboratory is not confined solely to experimental jobs. Every other make of carburetor is given its tests, and its advantages and disadvantages discovered. In this respect the carburetor maker is far in advance of the car maker. He knows his rival's product whereas the car maker knows little about the other maker's car. The carburetor laboratory is doing amazing work for the industry today.

In the Chemical Room

While Figs. 6 and 8 show views of the physical laboratory there are two other carburetor laboratories, one is the chemical laboratory, Fig. 9, and the other is the refrigeration room illustrated recently in Motor Age. The chemical laboratory is for the analysis of various grades of

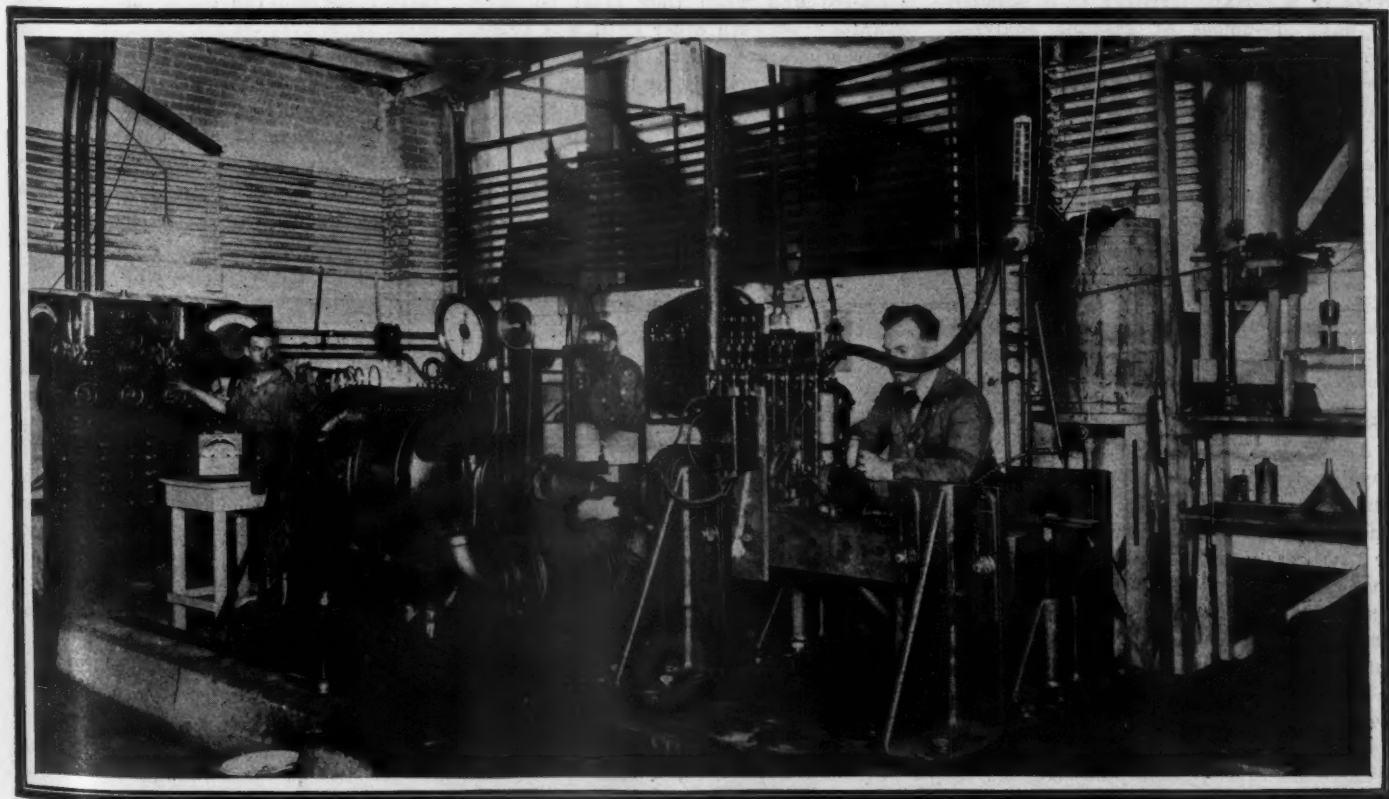


FIG. 8—WHEELER & SCHEBLER PHYSICAL TESTING LABORATORY

In this laboratory carburetors on test are fitted to the motor which is also connected to an electric dynamometer. Three men conduct a test. The right-hand one works with the carburetor, the middle one takes the dynamometer readings and the left one handles the switchboard

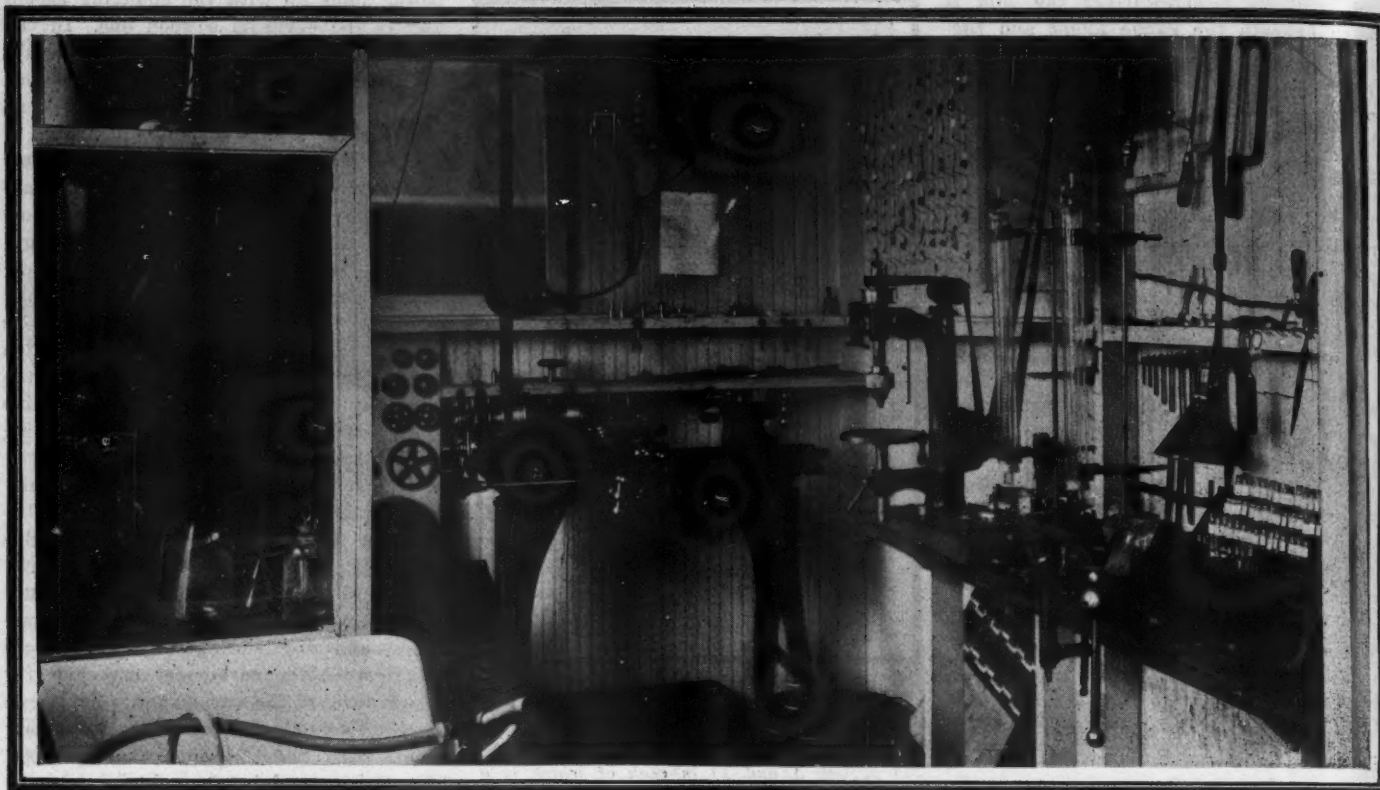


FIG. 9—CHEMICAL LABORATORY IN WHEELER & SCHEBLER FACTORY

This laboratory is used for testing the different grades of gasoline and other fuel as well as for examining different grades of fuel. It is a most important part of the factory

gasolines, naphthas, alcohols and the myriad other fuels. Here the finest analyses are made. The merits of respective grades of gasolines are discovered. If a certain dealer is having trouble with his carbureter in a certain territory it is possible to have specimens of gasoline analyzed and the cause of the trouble may be found. The field of this laboratory is world wide and only expert chemists are employed. In the refrigeration laboratory arrangements are made to have the motor and carbureter in it run at any degree of cold, so that it can be determined if the carbureter will work in Alaska, in Greenland or in the most northern parts of United States and Canada. This is most essential, because it would be serious were a carbureter produced and marketed which would not give results in cold climates.

Production Manager's Work

After the jig man, the chemist, the physical tester and others have done their parts then comes the work of the production manager. He has to get out 1,200 or 1,500 carbureters per day with a limited floor space and with a limited force. System is his watchword. He must systematize everywhere. He must lay his factory out to get the best results. He must have it properly lighted, properly ventilated, properly arranged and must provide proper means whereby the workmen can accomplish results. In a carbureter plant where thousands of small parts are produced daily the systematic handling of them is a problem. In the Wheeler & Schebler plant the use of trays and wheeled trucks

is carried to the highest degree. Fig. 10 shows a small wheeled tray filled with body castings before finally finished. Fig. 12 shows a much larger tray filled with similar castings after they have been lacquered and when they must be kept separate from each other until well dried. The castings are placed directly on this tray by the workman and when filled a boy can wheel it to the part of the factory where next needed. This is a large three-deck tray with the top deck of correct height for the workman. In Fig. 13 is a series of wall brackets on which single shelves are supported. These shelves contain burnished small parts that must be kept well apart. Instead of hav-

ing each shelf on a set of wheels, it is fitted with end handles and is carried from the workman's table to the shelves by a couple of assistants, or if not carried can be wheeled there. Such a series of wall shelves contains an enormous number of parts in a very small space. When the tray is being filled by the workman it generally rests on his table or on a bracket built to support it. Throughout the entire plant trays of this nature are used and the raw and finished materials are kept off the floors. This makes it possible to keep them clean.

Storing Extra Parts

Fig. 11 shows an interesting detail of factory organization in the form of long rows of bins across the end of the assembly room for carrying extra parts. Generally the parts for the machine shop come from the foundry machine shop and go direct to the workman, but frequently the capacity of the foundry shops exceed that of the machine shop and then the surplus is put in these bins. There is a separate bin for each piece and often when the bin capacity is reached some extra parts are piled on the tops. The aisle between the bins is wide enough for the wheeled trays and these trays are of the same height as the bins so that the labor of loading and unloading is minimized. The elevator to carry parts from lower to higher floors and vice versa is located at the far end of the bins, a most convenient location.

But the amount of system required by the production manager is not confined simply to the production of the

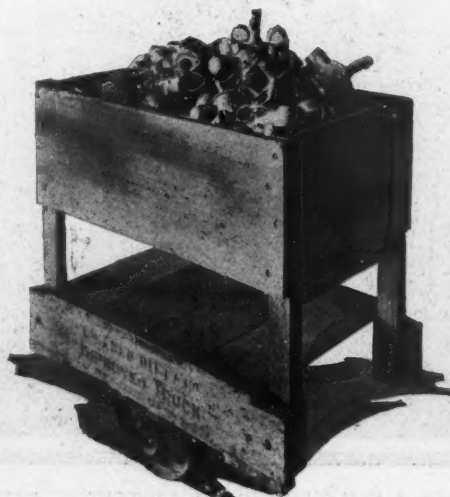


FIG. 10—WOOD TRAY FOR ROUGH CARBURETER CASTINGS

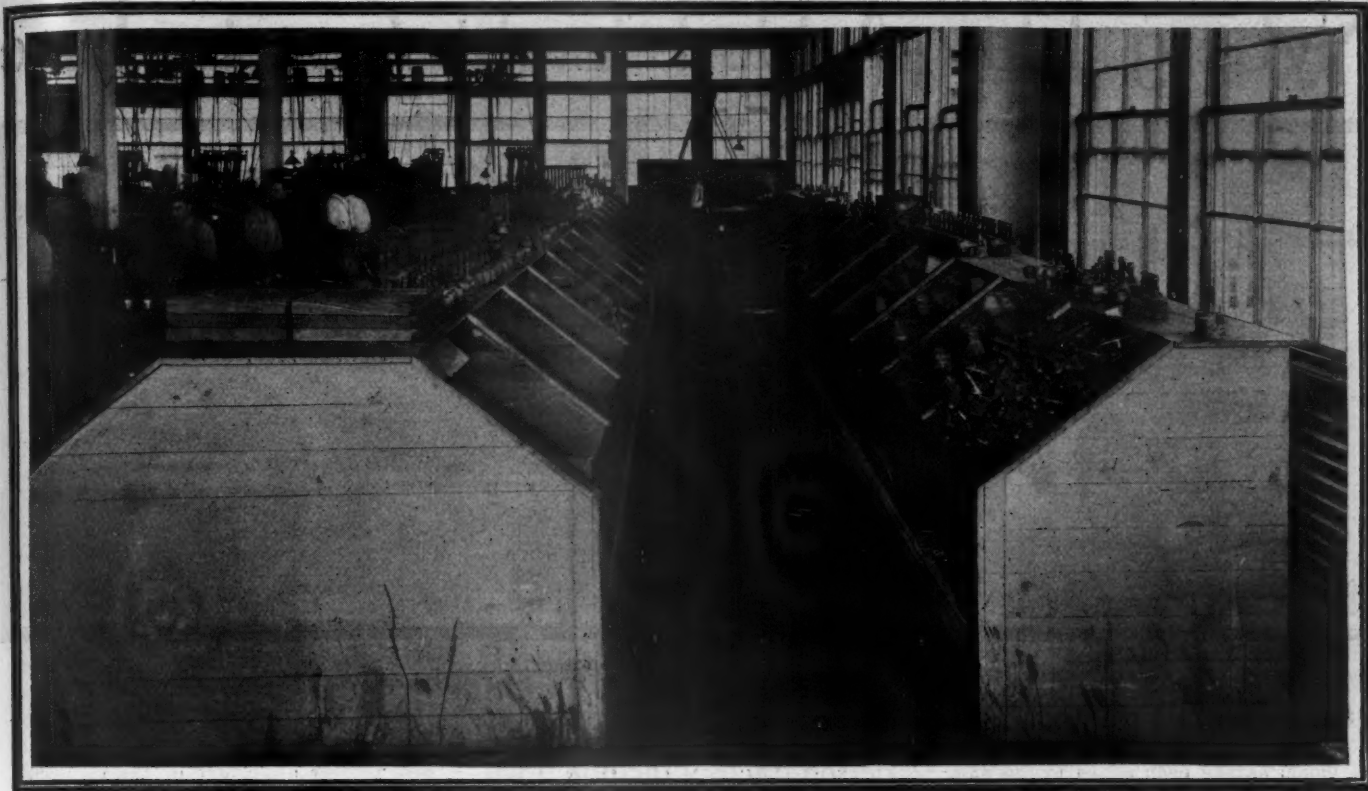


FIG. 11—SURPLUS PARTS' BINS IN ASSEMBLY ROOM OF WHEELER & SCHEBLER CARBURETER FACTORY

necessary component carbureter parts and their assembly into the completed instrument, he has many other things to do. He must keep a supply of all of the parts of the different models made from year to year since the inception of the company. This is a herculean task. Take the matter of springs alone for the auxiliary air valve. Over a score of different springs are needed for one model. There is the spring for standard use, which is the average one employed; there is the

spring for the seat level work in a California; there is the spring for high-altitude work like Denver; and there is the spring for excessively cold weather. But if this were all his task would not be difficult, but go a step further: Nearly every car maker wants a spring specially suited for his motor, which has its own characteristics and so calls for special attention in the spring line. Then it must also have its special springs for the California field, for Colorado and for average use.

What is true of the spring field is also true of the hot air intake horns. Blue prints must be made up for the different motors, so that everything fits properly. It may be there are over a hundred different designs of these.

Up to the present time it has been necessary for many carbureter makers to have special intake manifolds for the different motors, due to differences in flange sizes, etc. This has been a ridiculous situation, but one that has to be met.

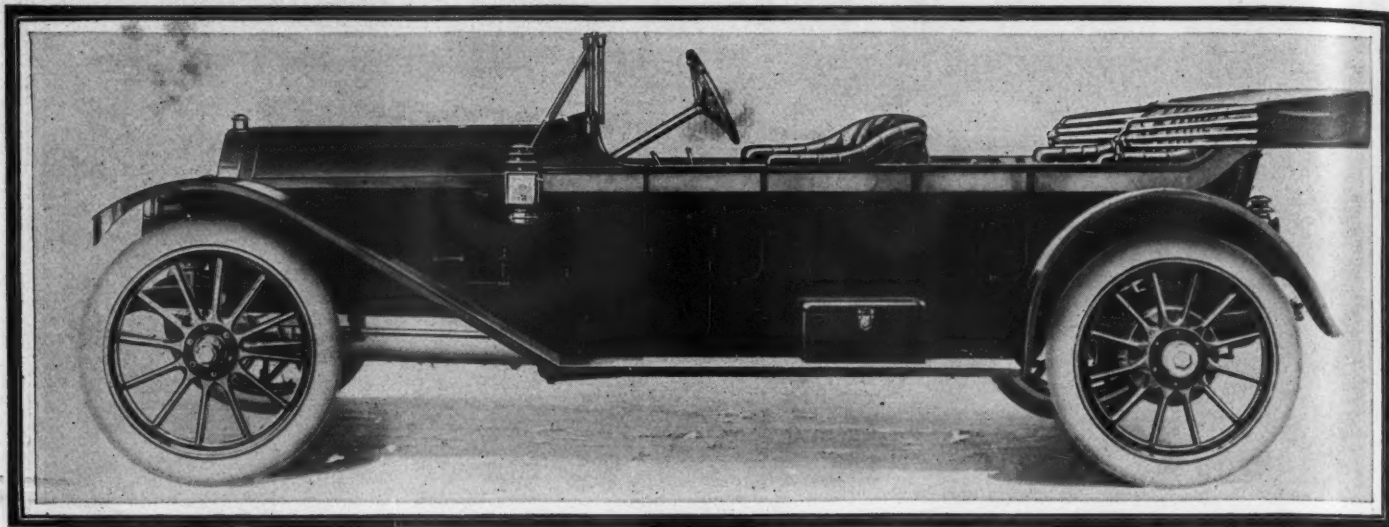


FIG. 12—THREE-DECK WHEELED TRAY FOR FINISHED CARBURETER PARTS



FIG. 13—WALL SHELVES FOR FINISHED PARTS OF CARBURETERS IN WHEELER & SCHEBLER FACTORY.

Nyberg Has Added Light Car to Line



NYBERG 1913 SIX-CYLINDER TOURABOUT SHOWING NEW BODY LINES

FOUR distinct chassis models will comprise the 1913 line of Nyberg cars, a new model having been added to the number for this year. The new model is the smallest of the fleet and is known as the 4-37. The three older models, which are continued for the new season, mechanically the same as this, are the 4-40, 6-45 and 6-60. The same general construction is employed throughout the four models, and they differ only in sizes of the various parts. On the three larger models two different wheelbases are employed, the roadsters and smaller touring cars having a shorter wheelbase than the larger touring car. The motor sizes and wheelbases of the four models are as follows:

Model	Cylinder	Bore Inches	Stroke Inches	Wheelbase Inches
4-37	4	3 3/4	5 1/4	118
4-40	4	4 1/4	5 1/4	118-126
6-45	6	3 3/4	5	126-134
6-60	6	4 1/4	5 1/4	126-134

All of the different models of Nyberg cars follow the same general lines in their designs. They have a unit power plant, with three points of suspension; enclosed flywheel and an enclosed multiple-disk clutch, which runs dry or in oil as desired; two universal joints in the final drive; floating pressed steel rear axle; and a drop forged front axle of I-beam construction. The frame is made of pressed steel and is unusually heavy, having a drop in front of the rear axle. The rear springs are bolted directly on to the cross member, which makes the rear spring support a part of the frame instead of having an additional piece riveted on for that purpose. The rear springs are three-quarter elliptic, 51 inches long, while the front ones are semi-elliptic and are 38 inches in length.

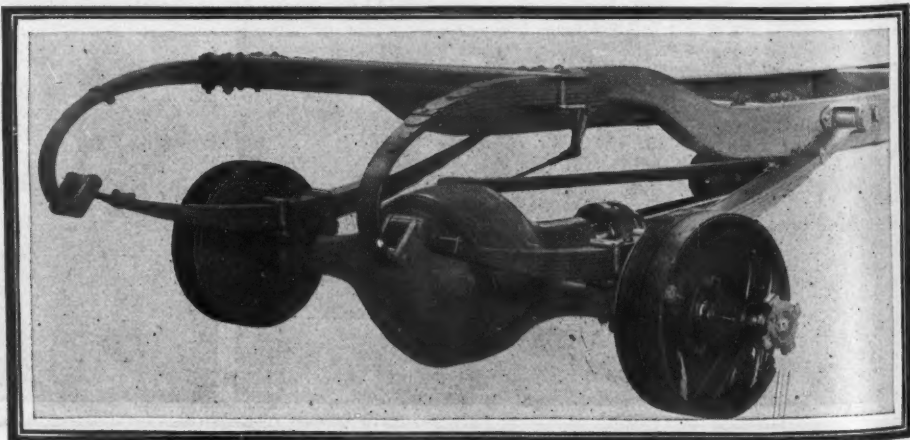
In the 4-37 model is the new long-stroke Rutenber motor with a 3 3/4-inch bore and a 5 1/4-inch stroke. This engine is so well known that a detailed description of it is unnecessary. However, this particular motor has some interesting new features

Four Chassis Models of Anderson Factory Include Two Sixes and Two Fours—Details of New 4-37

worthy of emphasis. Chief of these is the fact that the magneto and pump are located in the front instead of on the side, and are driven by the same two-to-one gear which turns the camshaft. Another feature of this motor is that its cylinders are cast en bloc. The valves work by means of a direct lever and a roller lift from the drop-forged camshaft, the lifters being offset. Every part of the motor is enclosed. The crankcase is made of a special aluminum alloy and is well ribbed in order to make it extremely strong. The pistons are very large, but are balanced so as to reduce the friction, both on them and on the cylinder walls. The five rings are of the eccentric type and made of a special alloy to allow for a great deal of elasticity. The crankshaft is unusually large, being 2 1/4 inches in diameter. It also is made of a special

alloy, is machined and ground to micrometer sizes to insure quiet running. To assure perfect alignment of the crankshaft, it is supported by five exceptionally large bearings. These bearings in the motor are plain, while everywhere else throughout the construction of the Nyberg cars annular ball bearings are used.

Ignition is supplied by Remy magneto and a Schebler or Stromberg carburetor is the vaporizing element. The clutch on all the models of the Nyberg cars is of the multiple-disk variety. There are six driving disks which are faced on both sides with raybestos, while the seven driven disks are of steel. A gearset of the selective type with three forward speeds; gears and shafts are nickel-steel, hardened and ground; annular bearings of liberal size are supplied in the gearset and the latter is attached to the crankcase just behind the flywheel housing in order to make the unit power plant, and is in no way connected with the frame. This secures an accurate alignment of the transmission with the motor, thus preventing any unnecessary strain on those parts.



REAR AXLE AND SPRING SUSPENSION ON 1913 NYBERG

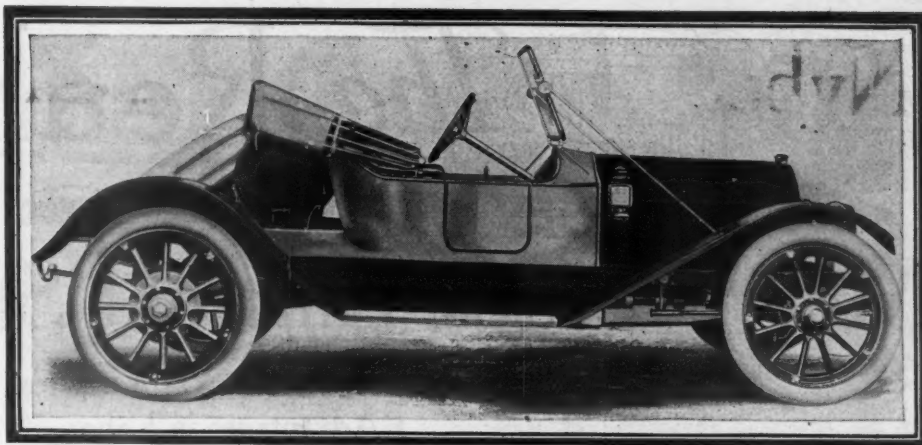
In the final drive two large universal joints are used, which are both enclosed and packed in grease, thus protecting them from dust and making possible their thorough oiling.

In all the models of Nyberg cars, the Hess floating pressed steel rear axle is used. This axle presents a very neat appearance, since it is all in one piece of steel and with a smooth surface, leaving no corners or pockets in which mud or grease can collect, and reducing to a minimum the difficulty of keeping the car clean. The part of the axle which serves as the housing for the differential is oval shaped, having a cap on the rear of it which can be removed. In this way, the differential can be inspected, adjusted, or removed without the necessity of jacking up the car.

Both the service and the emergency brakes are of the internal expanding type. On the model 4-37 the brake drums are 14 inches in diameter, while on all of the other models they are 16 inches in diameter. The service and the emergency brakes are placed side by side within the brake drums and when the power is applied to them they are forced by means of a lever to run against the drums. The brakes are $1\frac{1}{4}$ inches wide and are covered with raybestos.

The 4-40 and 6-60 models are alike in practically every respect except that four cylinders are used in the one and six cylinders in the other. The cylinders have a bore of $4\frac{1}{4}$ inches and a stroke of $5\frac{1}{4}$ inches and are cast separately. The motors have the pump and magneto on the right side and the valves on the left. For the Nyberg 6-45 model, a six-cylinder motor with a $3\frac{3}{4}$ -inch bore and 5-inch stroke is used. This engine has its cylinders cast in pairs, but in all other respects it follows the same design in its construction as the motor used in the other models.

The bodies fitted on these chassis include a roadster and five-passenger touring car on the 4-37 with a wheelbase of 118 inches. In the 4-40 model the same wheelbase is used with roadster and five-passenger body, while in the seven-passenger touring and



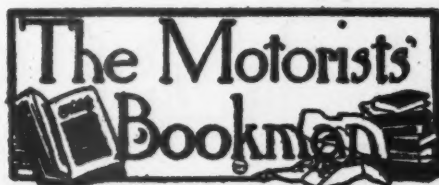
ROADSTER BODY FITTED TO 1913 NYBERG 6-40 AND 6-45 CHASSIS

the tourabouts, the wheelbase is 126 inches. The two six-cylinder models fit roadster and five-passenger touring bodies on a 126-inch, and the tourabouts and seven-passenger bodies on a 134-inch wheelbase.

The four-passenger tourabout is one of the new-style bodies for 1913 cars. This body is long and low, which gives it a racy appearance. This impression is exaggerated by the high seats which the body has. Both the front and rear tonneaus are very wide, which gives the passengers an increased amount of leg room. The seven-passenger bodies have the same length of wheelbase as the tourabout, but additional room is provided for in the rear tonneau

by extending the body farther over the rear wheels. These seven-passenger cars have two extra revolving seats. The floor of the tonneau is covered with a very heavy black carpet, which adds much to the neatness of its appearance. The front tonneau is floored with a dark green linoleum which is held down by an aluminum moulding.

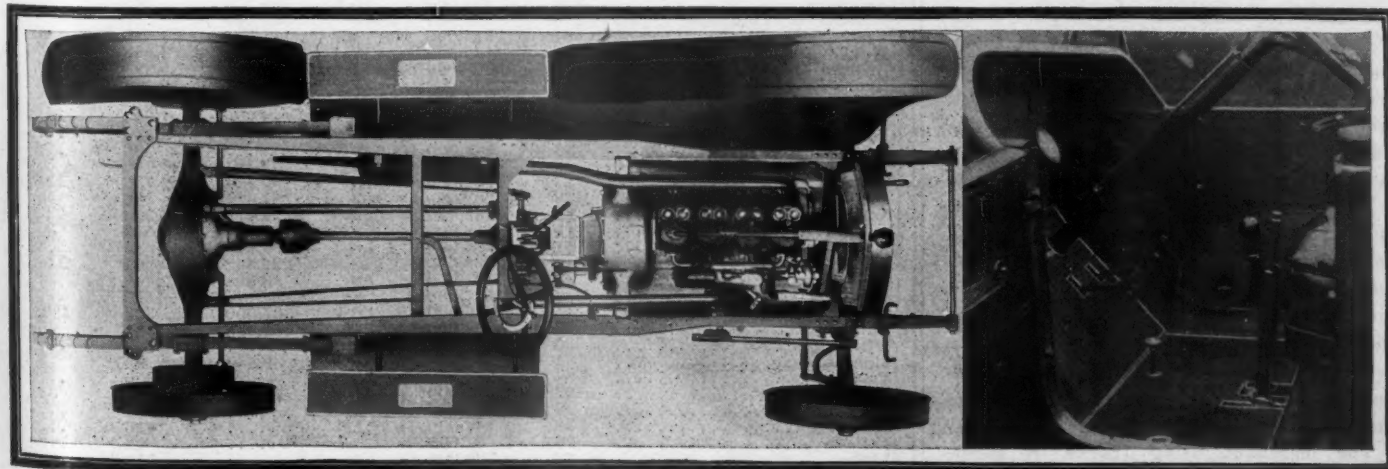
In 1913 the Nyberg cars will be trimmed with nickel. Another attractive feature of the cars will be the fact that the step-hangers are enclosed, that the dust-shields present an unbroken surface between the aluminum running board and the bottom part of the body.



Liquid Fuel and Its Apparatus

AS AN abridged and abbreviated revision of the author's previous work on the subject, "Liquid Fuel and its Apparatus," by William H. Booth, F. G. S., is published by Constable & Co., London. This work deals broadly with the utilization of petroleum and its products in the

production of power. It discusses mainly the use of crude and heavy oils in the generation of steam, treating, however, the use of these products in internal combustion engines, such as the Diesel, the Griffin, and the Hornsby. As is shown by the author, these latter engines, the first of the three discussed in particular, show much greater thermal efficiency and economy than steam applications, and produce power in great quantities with the minimum of waste of space and fuel. The book is illustrated with 120 drawings, diagrams and tables, contains 278 pages, and sells for \$2.25.



PLAN VIEW OF NYBERG 4-40 CHASSIS

CENTER CONTROL OF NYBERG



The Realm of the

Motor Truck Efficient Strike-Breaker

RECENT strikes abroad have awakened the tradesmen of England especially to the enormous advantages of motor vehicles in times of trade disturbances, and at the same time have brought them to an understanding of the motor truck as a delivery proposition which has entirely changed the general opinion and attitude toward the new delivery.

There is an especial disadvantage to the horse owner in times of strikes, for when his equipment is idle he is at a continual expense of feed and care for his horses which also lose through lack of exercise, and in a measure he is at the mercy of the strikers even though he does not take his wagons out.

If he attempts a delivery it is an easy matter for strikers to interfere and stop progress even though they commit no acts of real violence by cutting harness or the like, a thing which abroad if not here would get them into trouble at once. A horse system is easily impeded.

With motor trucks there can be no such interference, for to meddle with truck mechanism would be almost impossible on the road and a crowd of strikers on the approach of a truck would have to give way. True, in America they might beat up the driver, but no other feasible method of putting the truck out of commission seems to present itself without a real concentrated attack which might smash parts after the driver were put out of commission.

When the recent railway strike took place in England there was at once a strong movement toward the adoption of motor trucks by many of the larger firms and factories that are still behind with orders which have come in, many of them unsolicited. As a matter of self-protection firms which had to have deliveries to proceed with their business when the railway was closed cast about for some way to get their goods from a distance.

An English motor car company was held up at the beginning of the strike in the delivery of forged parts for their cars from Manchester, 60 miles away. A motor truck was immediately dispatched to the distant city and returned with the consignment—a procedure followed out during all the strike, saving the firm thousands of dollars.

The merchant using trucks in these times learned more than the fact of the greater aggressiveness of the motor truck

Power Vehicles Are a Great Advantages in Labor Disturbances

in strike times. He found it as well a most aggressive business vehicle. He found for one thing that where his horses had been compelled to rest and feed at certain intervals during the day there need be no rest for the motor vehicle; that where horses made one trip a day the motor could make three; that where horses made a scant 20 miles a day the motor truck could and did make as high as 120

on their fine roads without difficulty. Inter-city work was possible and the name of the firm was spread about by the advertising on the truck sides over four times the territory formerly covered by horses. This brought added business and firms along the routes at the outside towns who learned that an order given one day would be delivered the next added to the trade largely in a short time. Places 40, 50 and even 60 miles away from business centers are visited daily by motor trucks in this class of trade.

The greatest surprise which the users received was when they found, however,

TABLE NO. 1. SHOWING RELATION OF DISTRIBUTION OF MOTOR TRUCKS TO POPULATION AND GOOD ROADS

STATE	Number of commercial motor vehicles in use in 1912	Population of State in 1910.	Population per square mile	Population in cities of 25,000 and upwards.	Miles of improved country roads in 1909.	Miles of paved streets in cities of 30,000 and up in 1907.
New York.....	7,892	9,113,000	191	6,355,280	12,787	2,952
Pennsylvania.....	2,664	7,665,000	171	3,015,161	3,365	2,154
Illinois.....	2,551	5,638,000	101	2,624,656	8,914	1,947
California.....	2,198	2,377,000	15	1,095,120	8,587	1,066
Massachusetts.....	2,045	3,366,000	419	2,155,475	8,463	1,912
Ohio.....	1,171	4,767,000	117	1,784,210	24,106	1,643
Michigan.....	1,146	2,810,000	49	939,929	6,900	687
New Jersey.....	1,080	2,537,000	338	1,368,927	3,377	687
Indiana.....	970	2,700,000	75	479,071	24,955	482
Minnesota.....	970	2,076,000	26	594,618	5,417	326
Missouri.....	832	3,293,000	48	1,080,087	4,755	1,119
Iowa.....	730	2,225,000	40	330,091	2,505	253
Wisconsin.....	580	2,333,000	42	592,885	10,167	590
Oregon.....	526	673,000	7	207,214	2,799	292
Connecticut.....	519	1,115,000	231	484,034	3,030	389
Rhode Island.....	410	543,000	508	367,851	1,042	377
Texas.....	382	3,897,000	15	473,375	4,892	358
Maryland.....	371	1,295,000	130	558,485	2,142	506
Colorado.....	239	799,000	8	286,854	320	118
Nebraska.....	220	1,192,000	15.5	194,328	249	167
District of Columbia.....	218	331,000	5,518	331,069	....	325
Utah.....	181	373,000	4.5	118,357	1,018	14
Washington.....	170	1,142,000	17	450,153	4,520	170
Georgia.....	155	2,609,000	44	301,608	5,978	249
Kentucky.....	146	2,290,000	57	352,607	10,114	354
Kansas.....	120	1,691,000	21	178,465	374	122
Virginia.....	100	2,062,000	51	292,638	1,903	191
North Carolina.....	96	2,206,000	45	59,762	2,313	....
South Dakota.....	96	584,000	8	....	286	....
Florida.....	83	753,000	14	95,481	1,752	54
Maine.....	78	742,000	25	109,421	2,703	115
Delaware.....	78	202,000	103	87,411	186	59
Tennessee.....	78	2,185,000	52	322,419	5,353	427
South Carolina.....	54	1,515,000	50	85,152	3,534	36
Arkansas.....	51	1,574,000	30	69,919	1,085	25
Alabama.....	48	2,138,000	42	222,342	3,264	118
New Hampshire.....	48	431,000	48	96,068	1,448	29
North Dakota.....	46	577,000	8	....	140	....
Louisiana.....	44	1,656,000	36.5	367,090	329	222
Oklahoma.....	42	1,657,000	24	89,483	361	40
Mississippi.....	36	1,797,000	39	....	342	....
Montana.....	34	376,000	3	39,165	95	3
Vermont.....	34	356,000	39	....	2,650	....
West Virginia.....	32	1,221,000	51	72,802	591	32
New Mexico.....	29	327,000	3	....	104	....
Wyoming.....	28	146,000	1.5	....	416	....
Nevada.....	26	82,000	7	....	46	....
Idaho.....	22	326,000	4	....	510.5	....
Arizona.....	21	204,000	2	....	273	....

Commercial Car



Geographical Distribution of Trucks

that their delivery costs were cut instead of increased. One large firm saved 53 per cent in delivery cost, cutting from 15 cents per ton mile which their rail delivery cost to 7 cents by motor truck. Another cut from 12 cents per package on a 12-mile haul to 8 cents per package on an 18-mile haul.

The strikes in England—first the railway strike and then the freight handlers' strike—have changed the entire attitude of the British dealer toward motor vehicles. Since the ability of the motor trucks has been so effectively demonstrated, the Britons view it in a different light.

N. A. A. M. Compiles Statistics Forecasting Future Growth of Industry

AS a basis for determining the controlling factors of the geographical distribution of motor trucks, and to a certain extent the forecasting of the future growth of motor haulage in different localities, the National Association of Automobile Manufacturers of New York has compiled the accompanying tables. The comparisons here given disclose interesting aspects of the field and form premises from

which useful conclusions may be drawn.

The frequent assumption that road conditions are the principal factor in the distribution of motor trucks in different localities is here belied by the facts, for states having the greatest mileage of good roads are not found among the leaders in the extent of truck usage. Ohio and Indiana, each with approximately double the mileage of improved country roads found in New York, have together but little over a fourth the number of motor trucks in use. Illinois, whose total improved road mileage is but one-third that of Indiana, has nearly three times the number of commercial motor cars.

The conclusion is therefore drawn that density population must constitute the determining factor in the number of trucks used in separate states. Yet Rhode Island, which outside of the District of Columbia has the greatest population per square mile, has but 410 motor trucks, while Connecticut, with a density of population of less than half that of Rhode Island, has 519 trucks. Here enters the factor of the size of territory included in the state. In this regard we find that Texas, the largest state in the union, has one truck to a thousand inhabitants, approximately, while the District of Columbia, the smallest territory under consideration, has one for but every 1,500. This in consideration of the fact that whereas Texas has but fifteen population to the square mile to the District's 5,518.

The controlling factor, therefore, as near as it can be segregated from the host of contributing influences, is concluded to be the proportion of population of a state living in large cities. An even closer relation is found also between the number of trucks and the number of miles of paved streets in a given state.

Other important influences, more or less independent of these conditions, are the general prosperity and temperament of the population. This accounts for the fact that California, whose progressiveness is well known, while ranking thirty-sixth in population per square mile, and twelfth in population, being the largest state in the union, next to Texas, ranks seventh alike in the proportion of population in large cities, in miles of improved country roads and miles of paved streets, and fourth in the number of motor trucks, while Missouri, ranking seventh in popu-

TABLE NO. 2. SHOWING STANDING OF STATES IN NUMBER OF MOTOR TRUCKS, POPULATION AND MILES OF GOOD ROAD

STATE	Rank in number of motor trucks	Rank in total population	Rank in population per square mile	Rank in population in cities of 25,000 and up	Rank in miles of improved roads	Rank in miles of paved streets in cities of 20,000 and up
New York	1	1	6	1	3	1
Pennsylvania	2	2	7	2	18	2
Illinois	3	3	11	3	6	3
California	4	12	36	7	7	4
Massachusetts	5	6	3	4	8	4
Ohio	6	4	9	5	2	5
Michigan	7	8	18	9	9	8
New Jersey	8	11	4	6	17	9
Indiana	9	9	12	14	1	13
Minnesota	10	19	30	10	11	18
Missouri	11	7	19	8	14	6
Iowa	12	15	25	21	24	21
Wisconsin	13	13	23	11	4	10
Oregon	14	35	42	27	21	20
Connecticut	15	31	5	13	20	15
Rhode Island	16	38	2	17	31	11
Texas	17	5	37	15	13	16
Maryland	18	27	8	12	26	11
Colorado	19	32	39	25	40	28
Nebraska	20	29	35	28	43	26
District of Columbia	21	43	1	20	..	19
Utah	22	41	43	30	32	38
Washington	23	30	34	16	15	25
Georgia	24	10	22	23	10	22
Kentucky	25	14	13	19	5	17
Kansas	26	22	33	29	36	27
Virginia	27	20	15	24	27	24
North Carolina	28	16	21	39	25	..
South Dakota	29	36	40	..	41	..
Florida	30	33	38	33	28	32
Maine	31	34	31	31	22	30
Delaware	32	47	10	35	44	31
Tennessee	33	17	14	22	12	14
South Carolina	34	26	17	36	16	34
Arkansas	35	25	29	38	30	37
Alabama	36	18	24	26	19	29
New Hampshire	37	39	20	32	29	36
North Dakota	38	37	41	..	45	..
Louisiana	39	24	28	18	39	23
Oklahoma	40	23	32	34	37	33
Mississippi	41	21	26	..	38	..
Montana	42	40	45	40	47	39
Vermont	43	42	27	..	23	..
West Virginia	44	28	16	37	33	35
New Mexico	45	44	46	..	46	..
Wyoming	46	48	48	..	35	..
Nevada	47	40	49	..	48	..
Idaho	48	45	44	..	34	..
Arizona	49	46	47	..	42	..

lation, nineteenth in density of population, eighth in proportion of population in large cities and sixth in miles of paved streets, ranks but fourteenth in the mileage of improved roads, and eleventh in the number of motor trucks.

Compared in percentages, the difference in this respect is even more marked for California, having 47 per cent of its population in large cities as against but 32.8 per cent in Missouri, 17.8 per cent of its country roads improved as against but 4.4 per cent in the latter state, shows but 50 per cent of its city streets paved, compared with 54 per cent in Missouri, while in percentage of trucks to each thousand population shows 92.5 per cent, as against but 25.3 per cent in Missouri.

From this it is seen that the difference in the truck market in these states is the result of the relative progressiveness and prosperity of their population.

That this factor has an important bearing on the subject may be seen in the comparison of those states whose quota of trucks is normal, subnormal and in excess of normal. In the first category come New York, Pennsylvania, Illinois, Massachusetts, Ohio, Michigan, Connecticut,

cut, Rhode Island, Texas, Georgia, Maine, South Carolina, Montana, New Mexico, Nevada, Washington and Delaware. In the second come New Jersey, Missouri, Washington, Maryland, Kentucky, Virginia, Tennessee, Alabama, New Hampshire, Louisiana and Oklahoma. In the third class, those states whose progressiveness is conceded, come California, Indiana, Nebraska, Utah, Iowa, Oregon, Kansas, Arkansas and Florida.

In the case of the deficiency of Washington and Oklahoma, consideration must be given their newness, for no one doubts the progressiveness or prosperity of either of these states.

MOTOR TRUCK PROBLEMS

"The attitude of big business institutions toward the commercial motor vehicle is rapidly changing" says Gleeson Murphy of the General Motors Truck Co. "The question no longer seems to be 'Can we safely adopt mechanical transportation?' but rather—'How can we best equip our business with motor trucks?' As the president of one big eastern house sagely points out, 'Long ago it was plain to us that unless the proposition of motor truck

installation was carefully considered and the pros and cons as to types and sizes investigated in a practical manner, economical, efficient and advantageous service could not be expected.'

"As a result of our experience with motor trucks and our study of the entire matter, it seems to us that any prospective installer of motor truck equipment will find his problem simplified if he will first answer for himself a few fundamental questions.

"First: What is the nature of the routes to be covered in the service? Is it all a town service or all a country service or does it partake of both characters?

"Second: What is the general character of the streets and roads? Are they comparatively level or are steep hills numerous?

"Third: What are the distances which each vehicle must cover in a day's round?

"Fourth: What is the character of the load to be carried? Is it light but bulky or heavy in comparison with the bulk?

"Fifth: Are the packages to be carried of large size, such as heavy furniture, pianos, safes, or the like, or are they small, such as groceries, jeweler's boxes, light dry goods, etc?

"Sixth: Are the goods and packages of such a nature that they must be protected from dust and rain or can they be carried in open wagons or so-called express bodies?

"Seventh: Are they of a fragile nature calling for unusually flexible spring suspension if the load is to be moved at speed?

"Eighth: What quantity of goods will usually be loaded up for each trip? Will the load be carried the full distance or only half the distance? Do the vehicles ordinarily return empty or are they partly loaded?

"Ninth: What is the most convenient body construction to admit of easy loading and unloading of the class of goods to be handled?

"Tenth: Would it be desirable in the case of heavy goods to enable the power of the motor to be utilized in loading and unloading.

"These are some of the principal questions for consideration in determining the type and size of motor trucks which will best meet individual requirements. Undoubtedly, there are many others but those I have mentioned will be sufficient to indicate how numerous are the points to be kept in mind. It is quite plain that three points—load to be carried, distance to be traveled, country to be covered—must all be carefully considered.

"Just as horses for a brewer's wagon or a heavy dray must be different from horses for light delivery wagons, so motor wagons for carrying tons of goods must be very different from light, comparatively speedy vehicles used for transporting parcels or goods not exceeding $\frac{1}{2}$ or $\frac{3}{4}$ ton in weight."

TABLE NO. 3. PERCENTAGES SHOWING RELATION OF MOTOR TRUCKS TO POPULATION AND GOOD ROADS

STATE	Per cent of trucks to each 1000 of population	Per cent of population in cities of 25,000 and up	Per cent of improved country roads to total roads	Per cent of paved streets in cities of 30,000 and up
New York	86.6	71	16.13	54
Pennsylvania	34.7	39.3	3.84	55
Illinois	45.2	47	9.47	38
California	92.5	47	17.87	50
Massachusetts	60.7	65	49	61
Ohio	24.5	35	27.13	50
Michigan	40.8	30.7	10	46
New Jersey	42.5	54	22.76	56
Indiana	36	17	36.7	42
Minnesota	46.7	28.6	6.83	17
Missouri	25.3	32.8	4.4	54
Iowa	32.8	16	2.45	19
Wisconsin	24.8	25	6.64	56
Oregon	78.1	30	9.49	37
Connecticut	46.5	45	24.08	50
Rhode Island	75.5	68	49.14	80
Texas	9.8	12	3.8	26
Maryland	28.6	43	12.77	92
Colorado	30	36	1.08	8
Nebraska	18.3	16	.31	24
District of Columbia	65.8	100	...	72
Utah	48.5	32	12.23	4
Washington	14.8	41.5	13.19	6.7
Georgia	5.9	11.5	7.27	48
Kentucky	6.3	11	18.82	64
Kansas	7.9	10.5	.38	16
Virginia	4.8	15	4.38	61
North Carolina	4.3	2.7	4.79	...
South Dakota	16.4	...	.5	...
Florida	11	12.5	9.97	40
Maine	10.5	14.7	10.59	80
Delaware	38	43.2	6.22	63
Tennessee	3.5	14.7	11.66	46
South Carolina	3.5	5.5	11.02	51
Arkansas	3.2	3	2.97	13
Alabama	2.2	10	6.58	22
New Hampshire	11.1	22.2	9.58	14
North Dakota	8	...	.23	...
Louisiana	2.6	22	1.32	41
Oklahoma	2.5	5.5	.5	17
Mississippi	2	...	.86	...
Montana	9.4	10.4	.41	3
Vermont	9.5	...	18.4	...
West Virginia	2.6	6	1.84	50
New Mexico	8.9	...	.61	...
Wyoming	19.1	...	3.94	...
Nevada	31.7	...	.36	...
Idaho	6.7	...	2.77	...
Arizona	10.3	...	4.56	...

English Motor Truck Solid Tire Sizes

THE following report received from A. E. A. M. Turner, technical press correspondent in London, gives particulars of tire dimensions on leading British motor truck and wagon chassis and also the average actual mileages obtained from the tires in every day use, with the average loads carried going and returning and the service engaged in. The mileage figures as given in the accompanying table, are in all cases the averages of three sets of tires on each size of vehicle; that is, "the mileage shown as the result of using a particular size of rubber is the figure obtained from wearing out three sets of six rubbers, or eighteen tires in all. These results are all from vehicles used in actual service—not from manufacturers' demonstration machines—and have come from two or three vehicles each of the same make and load capacity in the different sets of results. To wear out eighteen tires might take a truck 4 years or more, and then even this would not give a representative result, as, while one truck might have an exceedingly careful driver who might get an extra 1,000 or even 2,000 miles out of his tires three vehicles would be more likely to have average treatment meted out to them.

"All mileages given are for the band type of tire. Pressed-in or grip tires are used very little in England. The figures are from records kept on the services of large business concerns. In making comparisons with American vehicles it should be remembered that English motor trucks are rated in long tons, equivalent to 2,240 pounds.

"The six makes of chassis appearing in the table are the products of the following manufacturing companies: Karrier, Clayton & Co., Ltd., Huddlesfield; Lacre, Lacre Motor Car Co., Ltd., Letchworth; Leyland, Leyland Motors, Ltd., Leyland, Lancashire; Commer, Commercial Cars, Ltd., Luton; Belsize, Belsize Motors, Ltd., Clayton, Manchester; Hallford, J. & E. Hall, Dartford, Kent.

"The Lacre 2-ton chassis has a four-cylinder 30-horsepower engine, which is exceptionally large for a British 2-ton truck, the average horsepower of seven makes of this capacity being 20 horsepower. The Lacre company has no engine between a two-cylinder 18-horsepower model and its 30-horsepower four-cylinder engine.

"The remaining well known make, the Dennis, has been purchased principally by McNamara & Co., Ltd., the big motor haulage contractors of Finsbury, London, E. C., but they will not part with tire mileages. The Dennis chassis are all fairly small-wheeled machines—32 and 34 inches all around—and I have heard various complaints of tire trouble in connection with them. I think the fact of

London Correspondent Furnishes Some Interesting Information

the matter is that if a cheap, undersized or defective rubber has been fitted to a small wheel, it simply hastens the collapse of the tire, but does not necessarily destroy it. As you no doubt know, an inferior tire seldom wears out, but it gets destroyed easily in ordinary use, collapses, leaves the rim or band, etc.

"London motor buses, running on 4-inch singles, front, and 4-inch twins, rear, fitted exclusively to cast steel wheels, give about 21,000 miles per set of six rubbers on an average.

"Trucks and wagons with live-axle types of final drive, give, under fair treatment, a bigger mileage from tires than chain driven chassis, mainly owing to the nice take-up of the drive.

"Of the few remaining cases in Britain where the driver is seated over the engine, it is found that the life, particularly of the front rubbers, is greatly decreased. The weight on the front rubbers is greatly increased, and the tendency, as the vehicle is being propelled over the road, is for them to be driven into the road. It is therefore most economical to have the engine under a bonnet, from the point of view of tire economy.

"The writer would like to add that he

has been fairly actively in touch with rubber tires since 1892, and whether in carriage or solid motor tires, he has always found American rubber tires either distinctly better in quality, or at any rate as good as the best Continental tires. With the exception of the Dunlop Rubber Co., English solid tire makers are behind the continental ones. The main fault which I found in American tires was that there was not enough wearing rubber in them. They were merely shallow pads round the rim, and so we did not get a great mileage out of them. Their rubber, however, invariably wore with perfect evenness."

PROVES MOTOR ECONOMY

An interesting statement has been issued showing where the police department of Wilmington saved \$655.20 during the past year in its patrol operation, due to the substitution of a motor patrol for two horse-drawn vehicles and four horses. The motor patrol, a Pierce-Arrow, was used. It cost, complete, fully equipped, \$2,653.25; while a year's upkeep, including gasoline and oil, cost \$724.80, or \$60.40 per month. Two horse-drawn wagons cost \$1,380 to operate in a year, including upkeep, maintenance, etc., or an average of \$115 per month, which makes a saving of \$54.60 per month in favor of the motor car. The patrol wagon outfit, when new, cost \$2,250, while in the 18 years it was in service it cost the city \$24,840 to maintain.

ENGLISH MOTOR TRUCK SOLID TIRE SIZES AND MILEAGES

KARRIER CARS							
Capacity rating tons	—Tire Sizes—		Mileage per set of six tires	Loads out tons	Carried return tons about	Nature of work	Where used
	Front single inches	Rear twin inches					
1	32x3	32x2½	21,700	1½	¾	Ry. parcels dely.	London
1½	32x3	32x3	19,867	1½	¾	Liquor delivery	London
2	32x3½	36x3½	22,180	2½	1½	Cotton transport	Provinces
2½	32x4	36x4	17,360	2½	¾	General hauling	Provinces
3	32x4	36x4	15,841	3	¾	Oil tank wagons	Provinces
4	32x4½	36x4½	16,180	4½	3½	Cotton transport	Provinces
LACRE							
1	34x3	34x2½	23,200	¾	¾	Drapery and furn.	London
1½	34x3½	34x3½	16,870	1½	1½	Carpet cleaning	
2	34x4	34x4	18,740	2	2	Carpet cleaning	
3	34x4	34x4	15,460	3½	Empty	Haul. cases from docks	
4	34x4½	34x5	21,863	4	2½	Gas, hardware and supplies	
5	34x5	40x5½	16,910	5½	1½	Building material	
LEYLAND							
1	34x3½	34x3	24,670	1	¾	Mineral water	Provinces
1½	38x4	34x4	21,721	1½	¾	Furniture dely.	London
2	38x4	35x4	17,107	1½	¾	Bottled beer	London
2½	38x4	36x4	17,008	2	1½	Bottled beer	London
3	38x4½	37x4	15,200	3½	2	Beverages	
4	34x5	40x5	16,800	4	2½	Beer and cotton	
5	34x5½	40x5½	15,060	5	4½	Barreled beer	
6	34x6½	40x6½	15,780	6½	2		
COMMER							
1½	32x3	32x3	20,900	1½	¾	Paper	
2	32x3	32x3	15,840	2	¾	Gas, hardware	London
3	34x4	34x4	16,974	3	½	Provisions	
4	34x4½	34x5	15,602	4	1½	Furniture	
5	36x5½	40x5	16,002	5	3	Building materials	
6	36x6	40x5½	14,865	5½	2½	Contract haulage	
7	36x6½	40x6½	12,304	6½	3½	General haulage	Pickfords
BELSIZE							
1	32x2½	32x2½	18,885	1½	¾	General haulage	
1½	32x3½	32x3	17,570	1½	1½	Cotton transport	
3	36x4½	36x4	16,975	3	1½	Machinery transport	
5	36x5½	36x5	14,090	5½	4½	Cotton transport	
HALLFORD							
1½	34x3	36x3½	17,508	1½	1½	Laundry delivery	
2	34x3	36x3½	14,986	2	1	Boots and leather	
2½	34x4	40x4	16,808	2½	1½	Contract haulage	
3	30x4	40x4	13,962	3	2	Gen. contract haulage	
4	30x4½	40x4½	14,670	4	2	Bottled beer dely.	
5	32x5½	40x5½	16,680	5	1½	Barreled beer dely.	



Current Motor Car Patents

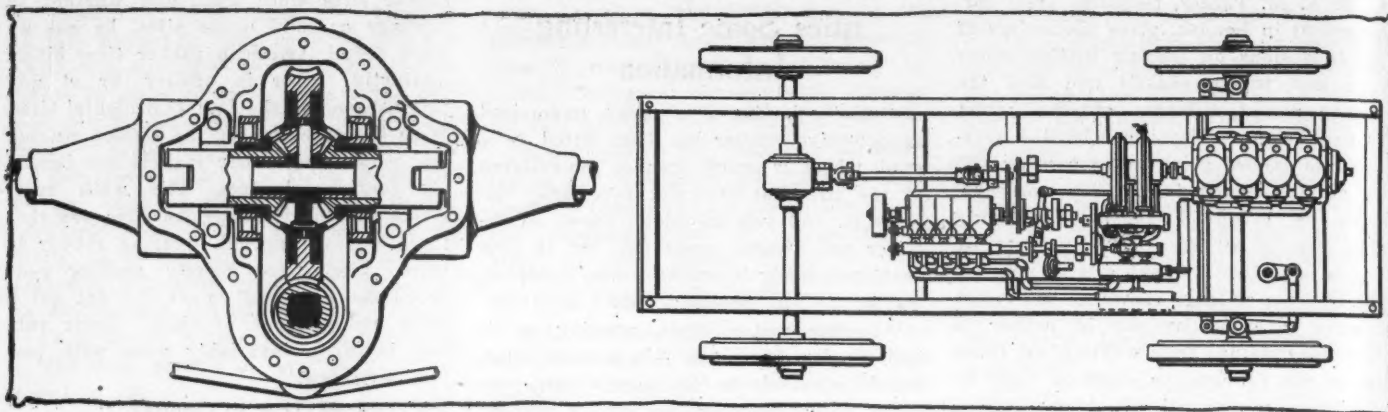


FIG. 1—WORM DRIVE BY T. J. LINDSAY OF INDIANAPOLIS AND OTIS HYDRAULIC TRANSMISSION

PATENTS ISSUED AUGUST 27, 1912

- 1,036,533—Vehicle Wheel. Wilburn C. Allen, Kansas City, Mo. Filed October 6, 1911. Serial No. 653,098.
- 1,036,536—Carburetor or Mixer for Internal Combustion Engines. Edward Glover Atkins, Minneapolis, Minn., assignor to Atkins Manufacturing Co., Minneapolis, Minn., a corporation. Filed July 8, 1909. Serial No. 506,478.
- 1,036,538—Roller Bearing. Charles A. L. Bach, Philadelphia, Pa. Filed November 10, 1909. Serial No. 527,269. Renewed January 20, 1912. Serial No. 672,476.
- 1,036,549—Automobile Radiator. Charles George Boeck, Jackson, Mich., assignor to the Novelty Manufacturing Co., Jackson, Mich., a corporation of Michigan. Filed October 16, 1911. Serial No. 654,929.
- 1,036,569—Ball Retainer. Charles E. Colegrove, East Cleveland, Ohio, assignor to the White Sewing Machine Co., Cleveland, Ohio, a corporation of Ohio. Filed January 2, 1909. Serial No. 470,388.
- 1,036,579—Resilient Wheel. Wellington W. Darling, Delta, Colo. Filed August 28, 1911. Serial No. 646,364.
- 1,036,602—Signal for Pneumatic Tires. Fred Leo Fuller, Sacramento, Cal. Filed February 3, 1912. Serial No. 675,230.
- 1,036,606—Friction Gearing. Johannes Geisler, Dresden, Germany. Filed November 14, 1910. Serial No. 592,316.
- 1,036,636—Lumber Truck. Fred W. Karches, St. Louis, Mo., assignor to Fidel Ganahl Lumber Co., St. Louis, Mo., a corporation of Missouri. Original application filed February 4, 1911. Serial No. 606,570. Divided and this application filed January 20, 1912. Serial No. 672,453.
- 1,036,659—Driving axle for Motor Vehicles. Thomas J. Lindsay, Indianapolis, Ind. Filed September 21, 1908. Serial No. 453,952.
- 1,036,685—Vehicle Wheel. Raul Diez Muro, Habana, Cuba. Filed October 29, 1910. Serial No. 598,656.
- 1,036,690—Variable Transmission Gearing. James Novak, Chicago, Ill. Filed February 23, 1910. Serial No. 545,302.
- 1,036,713—Combined Muffler and Exhaust Pipe for Internal Combustion Engines. Walter T. Rice, Chicago, Ill. Filed February 9, 1912. Serial No. 676,609.
- 1,036,748—Tire Removing Device. William H. Tobey, Winthrop, Mass. Filed October 16, 1911. Serial No. 654,971.
- 1,036,776—Tire Armor. Harry Auferl, New York, N. Y. Filed January 20, 1912. Serial No. 672,359.
- 1,036,828—Spring Wheel. Harry W. Good, Lanark, Ill. Filed February 26, 1912. Serial No. 680,022.
- 1,036,829—Cushion Tired Wheel. Norman Gratz, Boise, Idaho. Filed October 5, 1911. Serial No. 652,903.
- 1,036,856—Pneumatic Shock-Absorber for Vehicles. Gustav Kanter, Victoria, Australia. Filed October 19, 1911. Serial No. 655,557.
- 1,036,885—Automobile. Harvey A. Moyer, Syracuse, N. Y. Filed December 29, 1908. Serial No. 469,772.
- 1,036,942—Means for Identifying Motor or Other Vehicles in Case of Accident. Oscar A. Weissenborn, Jersey City, N. J. Filed August 22, 1911. Serial No. 645,369.
- 1,036,955—Tire. George V. Benninghoff, Meadville, Pa. Filed January 8, 1912. Serial No. 669,939.
- 1,036,972—Device for Starting Internal-Combustion Engines. David Eldredge Crouse, Annapolis, Md. Filed October 20, 1911. Serial No. 655,664.
- 1,036,981—Transmission Gearing. Cyrus C. Earnist, Riceville, Iowa. Filed October 9, 1911. Serial No. 653,578.
- 1,037,000—Controllable Headlight for Vehicles. Wilson B. Hargreaves, Bloomington, N. J. Filed October 24, 1911. Serial No. 656,540.
- 1,037,002—Reversing Transmission Mechanism. Norman T. Harrington, Lansing, Mich. Filed July 15, 1911. Serial No. 638,739.
- 1,037,004—Spring Wheel. Walter Hill, Mattoon, Ill. Filed December 2, 1911. Serial No. 663,579.
- 1,037,092—Means for Identifying Motor or Other Vehicles in Case of Accident. Oscar A. Weissenborn, Jersey City, N. J. Filed March 18, 1912. Serial No. 684,486.
- 1,037,094—Internal Combustion Motor. Edward P. Williams, Gloucester, Mass. Filed July 7, 1910. Serial No. 570,748.
- 1,037,126—Dump-Body Motor Truck. Robert S. Cassady, Alameda, Cal. Filed March 4, 1912. Serial No. 681,542.
- 1,037,138—Air Deflector. Harry Craft Dunlavy, Fresno, Cal. Filed June 23, 1911. Serial No. 634,843.
- 1,037,167—Means for Braking Traction Vehicles. William E. Paine, New York, N. Y. Filed March 14, 1912. Serial No. 683,885.
- 1,037,168—Traction Vehicle. William E. Paine, New York, N. Y. Filed April 11, 1912. Serial No. 690,170.
- 1,037,080—Agricultural Automobile Traction Engine. Francois Theillier, Le Grand Priel, France. Filed September 19, 1911. Serial No. 650,074.
- 1,037,183—Automobile License Tag Bracket. Edwin M. Rosenbluth, Philadelphia, Pa. Original application filed May 25, 1910. Serial No. 563,299. Divided and this application filed August 24, 1911. Serial No. 645,725.
- 1,037,144—Vehicle Wheel. Thomas J. Holland, Antigo, Wis. Filed April 20, 1911. Serial No. 622,377.

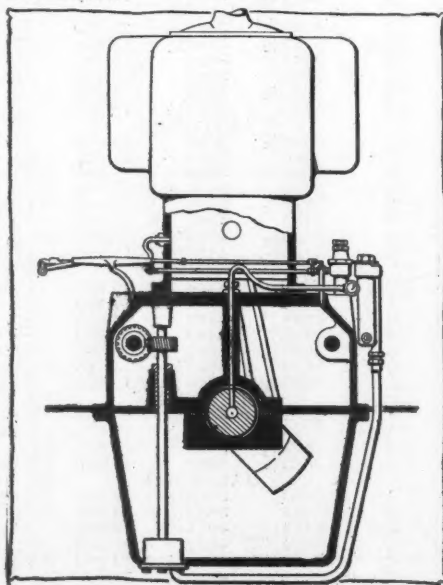


FIG. 2—PACKARD OILING SYSTEM

HYDROCARBON MOTOR—No. 623,624.

Sidney D. Waldon, Detroit, Mich., assignor to the Packard Motor Car Co. This patent relates to an oiling system applicable to various types of hydrocarbon motors. With this device, which is a species of pressure system operated by the motor shaft, the oil delivered is controlled by a pressure relief valve. There is means for normally feeding oil to certain parts of the motor and means controlled by the rise of pressure in the normal feeding system to feed oil to other parts of the system. Fig. 2 shows this system as applied in the motor crankcase.

Power Transmission System—No. 477,749.

August Sundh, Yonkers, N. Y.; assignor to the Otis Elevator Co. of Jersey City, N. J. A certain amount of interest attaches to the fact of the Otis Elevator Co. now making worm drives for motor vehicles, taking up a device along motor vehicle and truck lines in the shape of an hydraulic transmission. The patent covers a prime mover and pump connected to it fixed to deliver the fluid medium at different pressures to a motor, the connection between the pump and motor being controllable. The motor is made up of a number of sections, the power being proportional to the number connected. The pump valve and motor valve are controlled in a series of steps for different ranges of speed and power.

Pneumatic Wheel—No. 655,555. Gustav Kanter, Murtoa, Victoria, Australia. In the search for a spring wheel to take the place of the pneumatic tire many devices have been proposed. This especial construction, doing away with springs, aims at a pneumatic resiliency without the rubber wear of an air tire.

In this arrangement an annular air chamber is provided about the hub with a series of cylinders projecting radially from it and connected to it. A piston is arranged within each cylinder and thrust devices bearing on the floating rim. Fig. 3 shows a sectional view of this pneumatic wheel.

Manufacturers' Communications

NEED FOR NEW RATING

DETROIT, Mich.—Editor Motor Age—When a mathematical formula will not give the right answer, it is time that formula was abandoned. When the A. L. A. M. formula for rating horsepower will not give the horsepower which an engine will actually develop, it is time another method of figuring was adopted for the purpose.

There is but one kind of horsepower, and that is work accomplished. There is but one way definitely to measure 1 horsepower—that is by lifting 33,000 pounds 1 foot per minute. One horsepower in an engine is the capability of doing work equal to lifting 33,000 pounds 1 foot per minute.

For instance, a man lifting 33,000 bricks, each weighing a pound, and setting them on a platform 1 foot high in 1 minute, would be doing 1 horsepower of work. If, by means of a hoisting device, he could raise a block weighing 33,000 pounds 1 foot a minute, he would be doing work equal to 1 horsepower. Whether it is a man, a steam engine, an electric motor, or some other means of power, 1 horsepower represents exactly the same amount of work.

In a high-speed gas engine, such as is used in a motor car, the horsepower varies. In the case of the man lifting bricks, the faster he works, the higher will be his horsepower rating. The same is true of engine work. Thus, an engine developing a certain horsepower at 300 revolutions per minute will develop very much more at 1,000 revolutions per minute and still more at 1,500 revolutions per minute. If properly designed, its horsepower development will be still greater at higher speeds.

It therefore is obvious in rating an engine of a certain size that the speed of the engine has a direct bearing on the horsepower rating. An engine with four cylinders, each of which is 4 inches in diameter, with a stroke $4\frac{1}{2}$ inches, could be given any number of different ratings. Each might be accurate for the speed at which the engine was running when the horsepower was rated. It could be truthfully stated that such a motor was a 12 horsepower motor, if rated at 600 revolutions per minute; or you might say that it was a 20 horsepower motor, if it was rated at 1000 revolutions per minute; and if it was rated at 1,200 revolutions per minute it could accurately be called a 25 horsepower motor.

It therefore is necessary for comparative purposes to set some speed at which a motor should be rated. Again, there are two ways of rating a motor at a given speed—one is theoretical and the other practical. A theoretical rating may be ob-

tained by figuration, by using a certain formula to arrive at the horsepower. In some instances, the use of such a formula is the only possible means, as in deciding what size of motor would be required to do certain work. Yet, at best the formula method is rather misleading under most circumstances.

Where the motor is already in existence, there is a second means—that of testing the motor for horsepower. This means is positive and practical. The motor is connected with a testing apparatus, run at a certain speed, and the horsepower is actually measured.

The Royal Automobile Club of Great Britain, some years ago, decided upon a formula for computing horsepower which was later adopted by the engineers of the mechanical branch of the A. L. A. M. This formula, rating the motor at 1,000 feet piston speed, was decided upon, in this country at least, by a comparison of results of horsepowers obtained in actual test from numerous motors of various sizes and compressions.

By "1,000 feet piston speed" is meant, a motor running at such a number of revolutions per minute that the piston will move up and down in the cylinder at the rate of 1,000 feet per minute. For instance, if the stroke were 6 inches, the piston would travel down 6 inches and up 6 inches with each revolution of the motor, that is it would travel 1 foot with each revolution. Thus, in that motor, at 1,000 revolutions per minute, the piston would travel 1,000 feet. If the stroke were less than 6 inches, the motor would have to run faster than 1,000 revolutions per minute, and vice versa.

This formula was adopted several years

ago, and great strides have been made toward motor efficiency since that time. There is something wrong with a motor today that will not develop 50 per cent more horsepower than its rating by the A. L. A. M. formula. Such a rating is neither doing the motor justice, nor giving the parties interested an accurate idea of the power developed. There is, therefore, a necessity felt for a new rating by which motors of different sizes may be compared. At the present time there is no such formula and there is no standard speed. Various makers are rating motors of the same size at different horsepower, according to the speed upon which they base their calculations.

In the case of the Chalmers motors, although the old A. L. A. M. rating would not be within reason, it was thought desirable to stick as close to the once accepted formula as possible. The most reasonable workout seemed to be to stick to the old motor speed of the A. L. A. M. formula, and actually test the motors at 1,000 feet piston speed. Therefore, Chalmers motors are tested at 1,000 feet piston speed per minute, and the horsepower is determined by actual measurement at that speed.

The Chalmers "36" develops, as an average, 36 horsepower at 1,000 feet piston speed, or at 1,143 revolutions per minute. Yet by the A. L. A. M. rating, its horsepower is only 29. The Chalmers Six develops 54 horsepower under the same conditions, but by the A. L. A. M. rating its horsepower is only $43\frac{1}{2}$. Thus the inconsistency of the old A. L. A. M. formula is apparent.

On the other hand, it would be possible for us to test our motors, as some do, at 1,500 revolutions per minute and claim over 40 horsepower. I know of one instance where a motor of less bore and stroke than the Chalmers 36 is given a higher rating. This is obviously unfair both to the manufacturer who rates his motors at the accepted 1,000 feet piston speed, and to the purchaser who accepts as truthful a manufacturer's rating of his motor. Personally, I consider all rating made at other than 1,000 feet piston speed distinctly misleading unless the actual speed in revolutions per minute at which the rating is effective is given.

Rating the motor in the actual test at 1,000 feet piston speed seems advisable, as this is about the speed of the motor in ordinary actual use. This is obvious, upon consideration, inasmuch as the large motors, with longer strokes, will allow the car to be geared higher so as to let the motor run slower for a given speed of the car than would be possible with a small motor.—George W. Dunham, consulting engineer Chalmers Motor Co.

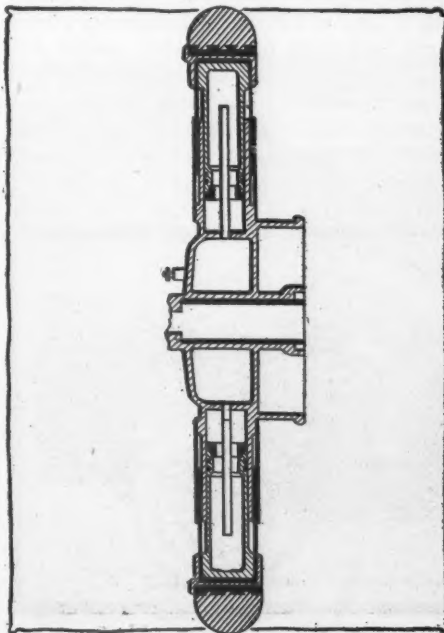


FIG. 3—AUSTRIAN PNEUMATIC WHEEL



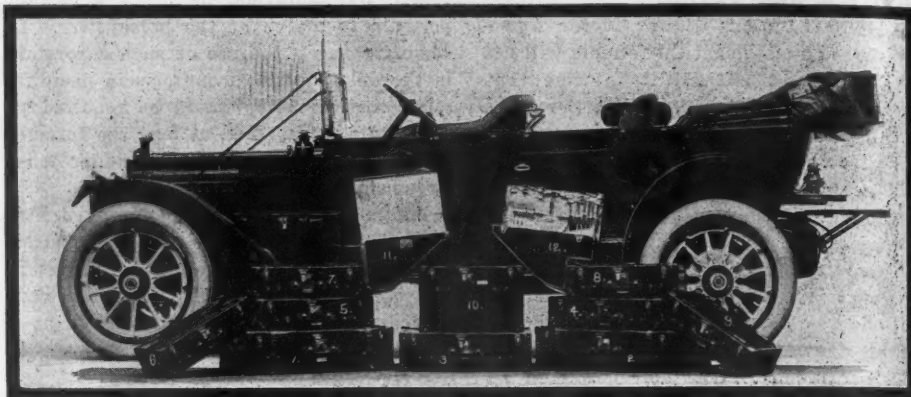
From the Four Winds



LONG Road Nearly Finished—The King Edward highway, or the reconstructed road from Longueuil to the intercolonial boundary at Rouse's Point, will be completed the latter part of September. The highway is 40 miles long and the total cost will be \$250,000.

Mexicans Keep Busy on Roads—Another step towards the construction of an extensive system of modern highways in the states of Hidalgo, Vera Cruz, Puebla and Mexico has just been taken by the department of communications and public works of the federal government. It has directed Engineer Eduardo Symonds, head of the bureau of inspection of roads and bridges, to confer with Governor Ramon Rosales of the state of Hidalgo on the subject of making early provision for completing the highway between Pachuca and this city. Mr. Symonds is also directed to confer with the authorities of other states in regard to constructing an extensive system of good roads that shall ultimately form a part of a general system of improved highways to extend to all parts of the republic.

Wisconsin's Car Count—The rank and wealth of Wisconsin as a motoring state is indicated by a compilation of statistics by A. J. Cobban, in charge of the motor registry and license department of the secretary of state's office at Madison. During the period from January 1 to July 1, 1912, there were licensed 23,505 motor cars and 3,816 motor cycles, a total of 27,321, or one motor vehicle to every eighty-five persons resident in Wisconsin, according to the given population of 2,333,860. If the average Wisconsin family consists of five persons, then every seventeenth family owns a motor vehicle. Milwaukee county, of course, leads in the number of registrations, but the figures have surprised even the most conservative guessers, being 5,120. The highest guesses were 4,000. Racine county ranks third with 1,015, while Kenosha county has but 401. The total receipts for registration fees during the



LUGGAGE EQUIPMENT USED BY C. J. MOORE

period were \$124,303, while the cost of administration was \$18,750.67. The sum of \$79,164.25 was distributed among the counties in accordance with the number of vehicles registered. Twenty-five per cent of the total receipts are turned into the state highway fund.

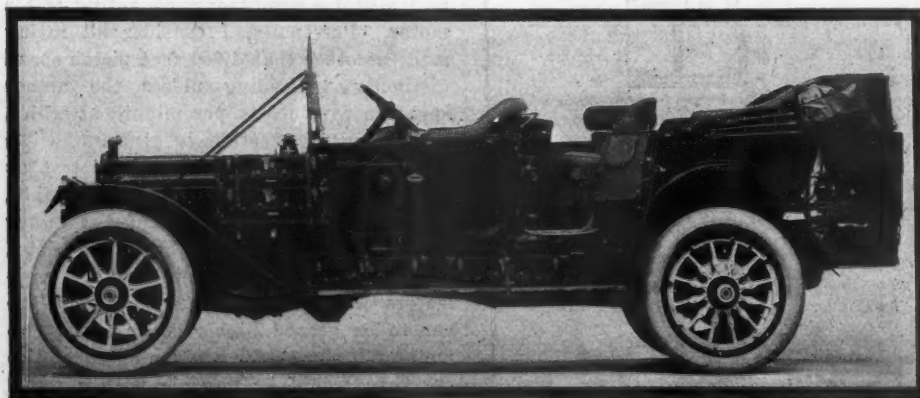
Ohio Orders 1913 Tags—The Ohio motor car department has awarded the contract to supply 75,000 sets of number plates for the year 1913 at a bid of 22¼ cents per set. The price paid is 1¼ cents lower than in 1912. The 1913 tags will have a white background with maroon letters. The tag will contain the letters "Ohio" and the figures "1913" in the same form as on the 1912 number plates.

Road Work Near Milwaukee—The estimates prepared by County Highway Commissioner H. J. Kuelling, of Milwaukee, for highway work under state aid during 1913, demand an appropriation of \$190,000 from Milwaukee county, this sum drawing \$65,000 from the state highway fund, making a total of \$255,000 available for permanent road work in Milwaukee county during next year. Commissioner Kuelling plans to rebuild 40 miles of roadway with concrete, the county to purchase \$40,000 worth of machinery and accomplish 20 miles of the work, while the remainder is

to be let to private contractors. Twenty miles of road are being paved with concrete this year, and according to present figures, every inch of public highway in Milwaukee county will be paved with a permanent pavement at the end of 5 years.

Working for Safe Bridge—Bay State motorists are complaining that no action seems to be made by the officials of West Brookfield, Mass., toward eliminating the dangerous condition at the Makepeace railroad crossing where four motor accidents have occurred within a year. It is one of the most dangerous between Springfield and Worcester, for vehicles coming in either direction cannot see each other. The Leominster Automobile Club has written a letter of protest to the selectmen of West Brookfield, and other clubs are now taking up the matter in an effort to have something done to improve conditions.

Woman's Tourist's Camp Wagon—The camp wagon shown in an accompanying illustration was made by the Kissel Motor Car Co. for Mrs. A. J. Payson, of San Mateo, Cal. This is designed for extended touring over rough and wild country where good hotels are few and far between. The chassis is a 50-horsepower Kissel 1-ton truck, and has a wheelbase of 132 inches. The seats are practically those of a roadster. Back of the seats is a space of about 1 foot on which rests the body as shown in the photograph. This body carries provisions, fishing tackle, guns and a very comfortable bed with spring mattress. When camp is struck, the canvas shown in the illustration is supported on gaspipe uprights which fasten into the body, giving a head room of about 6 feet. Gaspipe outriggers extend to each side and from the ends of these, side curtains are run to the top, making a pyramid-shaped tent. The bed then is swung crosswise on the chassis right back of the driver's seat inside of the tent, making a very comfortable boudoir, electric lighted from a



PACKARD CARRYING THIRTEEN PIECES OF BAGGAGE



FRENCH YOUNGSTERS MODEL CAR OUT OF SAND

storage battery. Mrs. Payson left San Francisco recently for an extend trip, her itinerary including a trip over the high Sierras, then up through eastern California, thence through Oregon, Washington and over into Idaho.

Cino in Long Race—Concerning the 200-mile race at Cincinnati, Haberer & Co., entrants of the Cino, point out that their car won the 50-mile cup; that it lost 22 minutes at the pits, mostly because of tire trouble and that its actual running time was 3 hours 13 minutes 15 seconds as against 3 hours 18 minutes 3½ seconds for the winning Mercer. The Cino had eighteen tire changes in 200 miles, caused by the use of "green" tires.

Columbus Wants Speedway—Since the 200-mile race given recently under the auspices of the Columbus Automobile Club was such a success from every standpoint, the club will now turn its attention to promoting a speedway. It is believed that a board speedway will be a success in central Ohio and the club will proceed on that theory to test out the sentiment among its members. The matter was taken up previously to the race, but the arrangement required the attention of the officers of the club and the speedway was dropped temporarily. The situation will be thoroughly canvassed in the near future.

Cars Ruled Off Reservation—As a result of several motor car accidents in which children have been killed and injured on the Revere Beach boulevard in Massachusetts within the past few weeks, the metropolitan park commission has closed the drive to motor cars for 10 days, and may extend the restriction until late in the fall. As a result the annual motor car parade at the beach in connection with the Mardi Gras festival next Saturday had to be declared off. The Massachusetts highway commission has come in for much criticism for not building a continuation of the state highway in the rear of the beach boulevard where vehicles could go

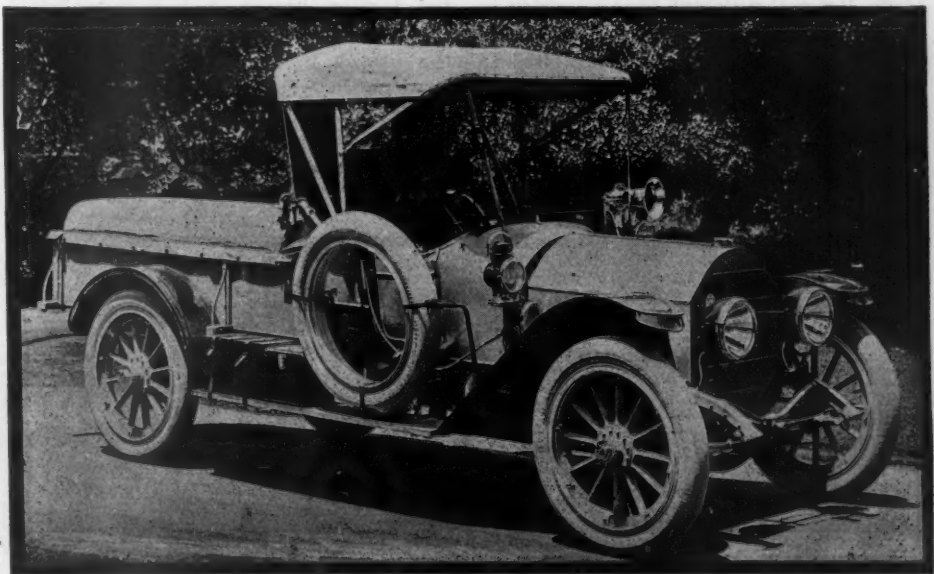
on crowded days and eliminate the danger. The boulevard is one of the through links to the north shore, and closing it will sadly disappoint the motorists.

Put's Hill May Go—Put's hill, named after General Israel Putnam, the revolutionary general, who made the hill famous by riding down its steep stone steps to escape capture from the British army more than a century ago, when the English were invading Connecticut, is destined to be wiped out by the march of progress. A hearing is to be held at Greenwich, Conn., shortly, at which the question of removing the hill will come up as it is located on the Boston post road used by thousands of motorists every year, and it is in the way.

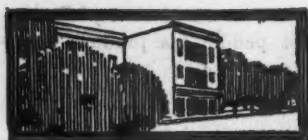
Keeps Down Cost of Living—Davenport, Ia., retail provision merchants are complaining that the increase in the number of motor cars has brought about a decided cut in prices. They say people living in the tri-cities and owning cars buy a large share of their provisions in the country

during the summer time and that while the farmer does not peddle his produce from house to house the city consumer has formed the habit of driving out into the country and making their purchases there instead of in town. This same practice is followed by transfer companies hauling with both horse-drawn and motor vehicles, as a truck is frequently sent out into the country to buy hay, straw and feed, the transfer firms finding they can buy at a far cheaper price there than of the city commission firms.

Modern Touring Equipment—For motor tourists who require ample packing facilities, the equipment designed by C. J. Moore is about the ultimate in accessibility and in economy of space. Mr. Moore is a consistent traveler, having covered about all of Europe and the greater part of the United States. Realizing what was most needed, he designed a set of luggage that may be easily and compactly stored away on a Packard touring car. There are thirteen pieces in the complete outfit, all designed for a certain purpose and position on the car. Each piece has a waterproof covering and is held in place by straps, which are easily detached from the car when the cases are removed. Two trunks are supported on the trunk rack, one above the other and a suit case is attached just below the rack. On the left front fender is a lunch kit and resting on this are two suit cases. Two suit cases have been placed on the left running board. An ice box is attached on the right front fender with a hat box above. The tire trunk is attached to the extra tires on the right running board. Two suit cases are placed in the tonneau under the robe rail. The trunks are fitted with trays and the suit cases with dividing boards. The ice box contains two galvanized trays, one for ice and one for eatables. Ice will keep for about 10 hours. The lunch kit contains plates, knives, forks, spoons and napkins for seven people, also drinking cups, salt and pepper shakers, etc.



KISSEL CAMP WAGON FOR WESTERNER'S TOUR



Among the Makers and Dealers



SPRING Company Expanding—The Tut-hill Spring Co., of Chicago, has been compelled by expanding business to buy the only remaining piece of unimproved property adjacent to its work. This is a lot 25 by 119 at 753 Mather street.

Two Concerns Change Names—The E-M-F and Flanders Sales Co. of Columbus, Ohio, has filed papers with the secretary of state changing its name to the G. E. Thomas Co. The Household Rubber Co. of Youngstown, Ohio, has filed papers with the secretary of state changing its name to the Auto Cycle Supply Co.

Canadian Shows—The motor show season in Canada will commence early this year, the dates for the Montreal show having been fixed for January 4 to January 11. The drill hall will again be the scene of the exhibition, as in recent years will be held under the auspices of the Automobile and Aero Club of Canada.

Hoosier Concern Reorganized—W. K. Millholland, who has been conducting the W. K. Millholland Machine Co., in Indianapolis, has reorganized the company under the same name and it has been incorporated with an authorized capitalization of \$50,000. Others interested in the company are Paul Millholland and A. M. Millholland. The concern is a contractor and manufacturer of motor car parts and is located in the Industrial building.

Another Motor Plant for Flint—Flint, Mich., is to have another important industrial enterprise through the organization of the Sterling Motor Co., which has filed articles of incorporation at Lansing. The company is capitalized at \$300,000 and will engage extensively in the manufacture of six-cylinder engines. The initial output of the new plant will be taken by the Little Motor Car Co., of Detroit, which is preparing to place a six-cylinder on the market next January. Detroit capital is invested in the company, which includes among its stockholders W. C. Durant, who recently organized the Republic Motor Co. of New York, with a capital of \$65,000,000. Although no authoritative announcement

has been made, it is understood that the Sterling Motor Co. will constitute one of the units of the Republic Motor Co., which already includes the Little Motor Car Co., the Chevrolet Motor Co. and the Mason Motor Co. of Flint.

Henderson Using a Tent—Having started shipments of its 1913 cars and being crowded for room the Henderson Motor Car Co. of Indianapolis has erected a huge tent in the factory yard to facilitate matters. Until the new addition to the factory is ready for occupancy, September 15, the overflow from the first assembly will be housed under the canvas, preparatory to the road test. The cars will then be handled in the main building and the finishing touches necessary to turn out the new Henderson added.

Speedwell Changes—The Speedwell Motor Car Co. of Dayton, Ohio, has reorganized its executive force, the changes bringing promotion and entailing new duties to several of the company's officers. President P. D. Schenck, who has been acting in that capacity since the company was organized, has assumed in addition the duties and responsibilities of general manager. J. E. Schneider, who has also been with the company since the beginning has been elected to the office of secretary and treasurer.

Goodyear Spreading Out—The Goodyear Tire and Rubber Co. of Akron, Ohio, is making preparations to open up branches in several of the countries in continental Europe, in England with head offices in London, and in South Africa and Australia. On September 5 L. C. Van Bever, of Toronto, Canada, vice-president of the Canadian company of the Goodyear Tire and Rubber Co., leaves for England to complete arrangements for the opening of the London branch, and to establish a complete distributing system throughout the British isles. Van Bever will form an English company of the American house. This will control the British interests of the company as well as those in South Africa and other British possessions. Other companies, it is understood

will be organized under the supervision of Mr. Van Bever, in France and Germany and arrangements are being made to form a company in Australia to supervise the business on that continent and in New Zealand.

Building Foundry in Detroit—The Pontiac Auto Castings Co., composed of men from Detroit and Muncie, Ind., has started the erection of a foundry on Linfere street, Detroit, and will engage in manufacturing brass castings for motor cars. Later aluminum work and iron castings are to be added to the output. The company is capitalized at \$15,000, and incorporation papers have been forwarded to Lansing for filing.

Making Cylinder Castings—The Reliance Foundry Co. of Richmond, Ind., has started making cylinder piston and piston ring castings. E. I. Hunt, formerly foreman of the Wayne Works foundry for 12 years, is president. George L. Schultz, also formerly of the Wayne works, is general manager. H. J. Brownell, secretary. These with John D. Teeter of the Light Inspection Car Co., Hagerstown, Ind., comprise the board of directors.

Indianapolis in Market—In line with its policy to displace horses in municipal service as rapidly as possible with motor vehicles, the city of Indianapolis is in the market for a gasoline ambulance to cost not to exceed \$5,500. The purchase will be made by the city board of health and charities, of which Dr. Herman G. Morgan is secretary. The new ambulance will displace two horse-drawn ambulances in use at the city hospital and city dispensary. The hospital already has a gasoline ambulance while the dispensary has an electric ambulance, both of which will be continued in service.

Chase Company Changes—C. W. Moody, of Cleveland, O., has recently severed his connection as district manager for the Chase Motor Truck Co., of Syracuse, N. Y. Royal B. Curtiss, of Stépney, Conn., has been appointed in his place. Mr. Curtiss was formerly sales manager of the Royal Equipment Co., at Bridgeport, Conn. In his new position he will have the oversight of a territory including Ohio, West Virginia, Kentucky, Michigan and part of Indiana. He will make his headquarters in Cleveland. W. C. Van Sant, who has represented the Chase Motor Truck Co. for several years past in the capacity of western traveling salesman, has lately been made district manager for the Pacific coast. His headquarters will be in Los Angeles, Cal. C. K. Thomas, formerly with the Lukenheimer Co., of Cincinnati, and later with the Best Mfg. Co., of Pittsburgh, Pa., is another recent addition to the staff of district managers of the Chase company. Mr.



CHEVROLET'S BIG SIGN IN DETROIT

The Chevrolet Motor Co. each day places the name of a different agent above the words "says so" on the sign. This idea was originated by W. C. Durant

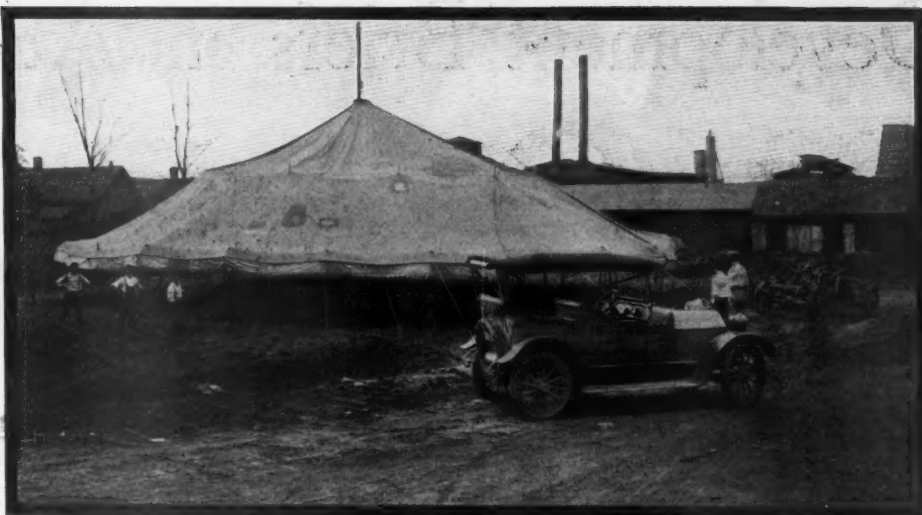
Thomas in his new capacity will make his headquarters in St. Louis, Mo. He will have oversight of a territory including Kansas, Missouri, Texas, Arkansas and Oklahoma.

Looking Into the Future—Officials of the Thomas B. Jeffery Co., of Kenosha, Wis., state that the company does not contemplate the erection of any new buildings on the 9-acre tract adjoining its present works, recently purchased, for the present. The additional land is to take care of the future needs of the Rambler works as they may develop.

Studebaker and Reo Cut Melons—Dividends have been declared by the Studebaker Corporation and by the Reo Motor Car Co. The Studebaker Corporation has declared its regular quarterly dividend of 1% per cent and the Reo company has announced its third distribution of profits this year amounting to about \$200,000, which is 10.9 per cent on its capital of \$2,000,000.

Akron Motorizing—The committee on fire and water of the Akron, O., city council at a recent meeting decided to act upon the recommendation of Chief Mertz and motorize the fire-fighting apparatus of Akron. It was decided to issue bonds in the sum of \$75,000 to take care of the expense. It was shown by the figures submitted by the chief that the difference in maintenance would more than pay the interest on the issue of \$75,000 bonds. Chief Mertz suggested the purchase of an 85-foot aerial truck and a number of combination hose wagons. A tractor also is recommended by the chief.

Berlin Gets Tire Plant—The property owners of Berlin, Ont., carried a by-law granting a bonus of \$25,000 to the Canadian Consolidated Rubber Co., for the purchase of 15 acres on which to erect a tire factory. The company, which has already extensive interests in Berlin, receives the \$25,000 and a fixed assessment for 10 years for that amount, after it has expended a quarter of a million dollars in buildings and equipment. This will mean the erec-



HENDERSON CRAMPED FOR ROOM

The Henderson Motor Car Co. of Indianapolis, being cramped for room, has erected a huge tent to facilitate shipments of 1913 cars.

tion of two large factories at once. The company agrees to employ 100 skilled workmen the first year, 200 the second and 500 in 5 years. The building operations are to commence immediately.

Willys Against Yearly Models—Following his recently adopted policy of banishing the yearly model in connection with Overland motor cars, President John N. Willys also will apply this policy to Garford cars. Garford and Overland cars will in the future be manufactured each working day in the year just as any staple product is manufactured.

Safeguarding Against Explosions—As a precaution against gas explosions in the plant of the A. O. Smith Co., of Milwaukee, it has been decided to rebuild and relocate the welding department, blown up a week ago, on ground remote from the general factory buildings, the largest of which measures 345 by 1,025 feet. The explosion which wrecked the welding shop caused the death of the oldest employe of the company and serious injury to a score of other workmen skilled in the handling

of oxy-acetylene and oxyhydric welding and cutting apparatus. A tank, 25 feet long and 10 feet in diameter, filled with hydrogen gas, was blown 1,000 feet.

Hazard Makes a Change—W. E. Hazard, formerly secretary and sales manager of the Hazard Motor Mfg. Co. of Rochester, has resigned. F. D. Russell, vice-president, will assume the duties of sales manager. Erle Miller is to succeed Hazard as secretary.

Swinehart Stock for Sale—The stockholders of the Swinehart Tire and Rubber Co. of Akron, Ohio, have been notified that \$150,000 worth of stock is offered for sale to the present stockholders at the rate of 23 per cent of their present holdings, no fractional shares to be considered. The new issue of stock is subject to action by the shareholders at a meeting called for September 25. The additional issue of stock is subject to action by the shareholders at a meeting called for September 25. The additional issue of stock was made necessary to provide a larger working capital.



FIRESTONE-COLUMBUS CARS USED BY COLUMBUS FIRE DEPARTMENT

Development Briefs in Accessory Field



FIG. 1—NEW FEATURES OF DISCO IGNITION STARTER

Simplified Disco—New Device Maintains Uniform Speed—Connecticut Absorber Adjustment

New Disco Acetylene Starter

DESIGNATED as model 16, the latest Disco acetylene starter has just been placed on the market. The new starter operates on the same principle as previous Discos, differing in the form of distributor valve and control thereof, and shows improvement in the engine valve design. The Disco starter of former years consisted of a distributor, mounted on the dash, with only its head protruding. This head was in the form of an ornamental controller plate, on which a small crank was placed. Connecting tubes from this distributor led to a two-way valve on the gas tank, and to each engine valve, the latter being substituted for the priming cups in each cylinder. The operating principle consists of the admission of compressed gas into the cold cylinder, by means of the rotation of the distribution valve, igniting it on the spark. The departures in the distributor design consist of the substitution of a needle valve for the one previously used, and a small single-throw lever on the controller plate, instead of the former crank. The engine valve this year is claimed to be self-cleaning. It consists of a three-way union, one lead of which is connected to the distributor line, another being threaded to fit the tap in the cylinder, and the third leading to the priming cup above. A small ball check valve is fitted, which, with the lever in the central

position, admits gas from the distributor to the engine, but locks against any return of gas from the cylinder. With the lever turned to the left, a direct passage is opened from the priming cup to the cylinder, for priming with gasoline and decarbonizing; and with the lever to the right, it opens a passage from the engine to the priming cup, past the ball check valve, permitting the exhaust gases, when the cylinder engine is running, to blow through the valve, cleaning it of all soot and carbon, or for compression relief, when turning the engine over for adjustment, decarbonization, etc. The device otherwise remains the same as previously designed. Fig. 1 shows the new parts.

Pierce Speed-Controller

Uniform speed is the object of the Pierce speed-controller, manufactured by the Pierce Speed-Controller Co., Anderson, Ind. It appears in two models, model C for pleasure cars and model T for commercial cars, the chief difference between them being that model C is equipped with a dash control and a 30-mile dial, and the other is controlled by a lock and dial on the instrument itself, and has a range of but 20 miles.

The device consists substantially of a speedometer, which instead of indicating to the driver the variations of speed of the machine as caused by the uneven running of the engine and the varying resistance offered to the progress of the car by different conditions of the road, operates instead an auxiliary throttle valve in such a way as to accommodate the power of the motor to the load, thus causing the car to progress at a uniform rate of speed.

The speedometer portion of the device is connected to one of the front wheels by the customary gears and flexible shaft, and is equipped with an adjustable connection to the butterfly valve, so that when set for a certain speed any increase of speed will close the butterfly valve, and any decrease will open it. The adjustment is accomplished by means of

a dial on top of the speedometer housing, which is provided with a lock and key and may be locked in any position.

At zero or open the valve may be locked for control by the regular throttle only. In use in touring such a device permits of a steady speed being maintained, regardless of any minor differences in road conditions or grades and without fear of stalling the motor; the clutch and steering, only, being required to control the running of the car.

As applied to commercial cars it can be locked at a certain speed, which the driver cannot exceed, but which he could easily attain—under ordinary road conditions—without running the motor to its utmost capacity, as is necessitated by governors geared to the engine. The regular throttle, of course, can be used to limit the speed below that at which the controller is set, but no movement of the throttle can cause the car to exceed this limit, it is asserted. It is applied between the manifold and the carburetor, no alterations being necessary to its application. It is shown in Fig. 5.

Adjustment on Connecticut Absorber

Greatly simplifying its attachment, the Connecticut Shock absorber, made by the Connecticut Shock Absorber Co., of Meriden, Conn., has been improved by the addition of a new adjustment. This absorber, shown in section in Fig. 3, oper-

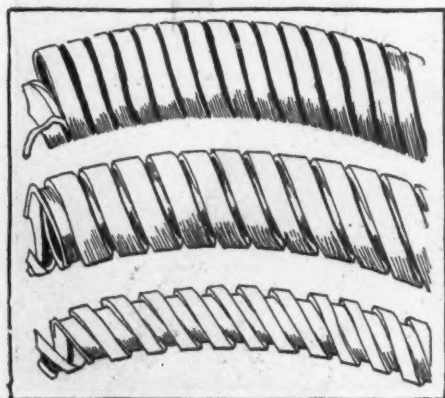


FIG. 2—TYPES OF AMERICAN TUBING

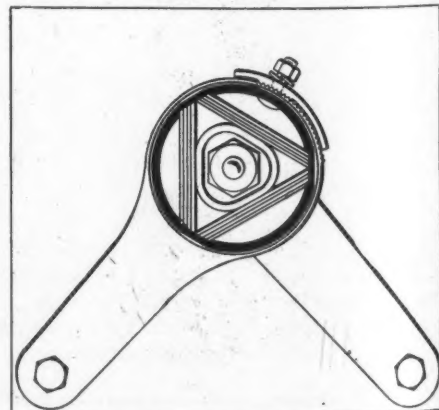


FIG. 3—NEW ABSORBER ADJUSTMENT

New Things for the Motoring Public

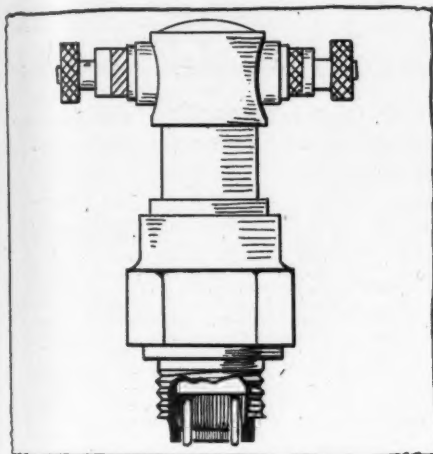


FIG. 4—SUPERIOR DOUBLE-POINT PLUG

ates on the spring and cam principle, and has previously been described and illustrated in these columns. This new adjustment consists of a milled clamp which fits the correspondingly milled casing of the device, rigidly clamping it to the inner shell, by means of an inversely disposed carriage bolt, by which means the two elements are adaptable to adjustment. When this clamp is loosened, the arms of the absorber are free to move in relation to one another, without affecting the position of the cam in reference to the springs; but when this clamp is tightened, all action is made through the shock-absorbing mechanism. To adjust these absorbers to a car, they are applied with the clamp loose, the car is loaded with weight equal to one passenger in excess of normal, and the clamps are tightened. Closer adjustment is made by adjusting the clamps with a lighter load, and looser adjustment is made by increasing the load at the time of adjustment. This improvement will be included with all of this company's product in the future.

Two-Spark Ignition Plug

On the theory that two sparks are better than one, the Superior Motor Specialty Co., of Philadelphia, Pa., has introduced the superior double-spark plug. Its claim is that these plugs will increase the power of an engine 17½ per cent, due to the fact that two points of ignition will facilitate flame propagation by decreasing the distance of flame spread. The theory being that each spark will ignite a different portion of the charge, thus cutting the lag in ignition approximately in two. The aim of this plug is to enable owners of motors equipped with but one spark plug tap to enjoy the advantages of two-spark ignition. They require no separate or extra timing device, as, when wired to a battery and magneto, the points may be used either singly, as a dual system, or simultaneously as a double system. The spark points are inclosed within the shell, and are claimed to be self-cleaning. As

shown in Fig. 4, these plugs have two electrodes, with binding posts on either side of the upper portion, and horizontal. The construction other than the unique design is standard throughout. It is claimed that these plugs will last longer than other types, and that they are the only ones on the market which may be used for double sparking without additional mechanical equipment.

Combination Gas and Electric Headlight

The P. G. N. combination gas and electric headlight of recent introduction is designed to furnish two distinct lighting systems in the same housing. They may be used separately or both at the same time. The combination consists of a gas burner and a reflector and an electric fitting with parabolic reflector above. Connections for both gas and electricity are supplied and the lamp is finished in nickel, enamel, or combinations of the two. It is manufactured by J. R. Pagin Lamp Co., Valparaiso, Ind.

Oscillating Valve-Grinder

Hailing from London, the Warrow reciprocating valve-grinder, manufactured by Brown Brother, Ltd., of London, Eng., consists of a revolving shaft operated by bevel gears from a hand crank, similar to an ordinary breast drill. The difference is that the shaft terminates in a screw-driver bit instead of the usual chuck, and the bevel driving gear, to which the crank is attached, it without half its teeth. The small driven bevel pinions, being opposed, are driven in opposite directions as the teeth of the driving gear engage them individually, producing a reciprocating or oscillatory movement, which is produced by a continuous rotation of the crank. The device is illustrated in Fig. 6.

Flexible Metal Conduits

Flexible tubing has been used for horn tubes and speedometer shaft casings until every motorist knows its value, but it is not until recently that its value in other lines has been taken advantage of to any

extent. Recently it has been used extensively for the conduction of hot air to carbureters, for auxiliary control connections and for exhaust. Newer uses are for the conduction of gas for headlights and air for tires, while lately its use for the protection of insulated wires, of which the modern motor car has such a multiplicity, has been greatly agitated. In response to this demand, the American Metal Hose Co., Waterbury, Conn., has brought

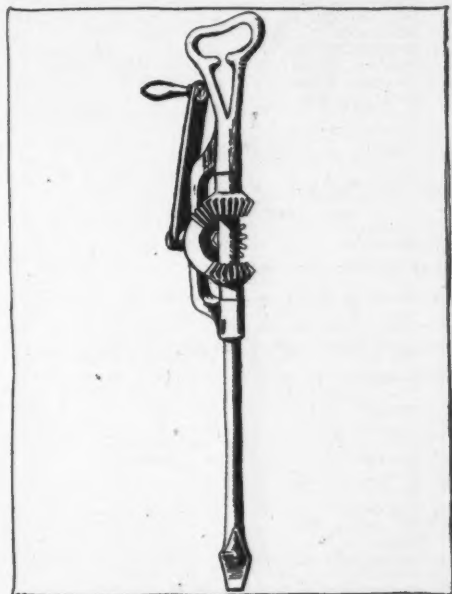


FIG. 6—WARROW VALVE GRINDER

out, in addition to a very complete line of flexible steam, oil, air, gas, water and special tubing, a new line of electric conduit tubing, of which three styles are shown in Fig. 2. Styles are shown for single wires, multiple wires, and special installations, where a heat, water and oil-proof covering is desired. The latter is asbestos packed, and is especially adapted to wiring near exhaust connections, in oily places, or where exposed to the weather. The other types shown are unpacked, of the interlocking and one-piece types.

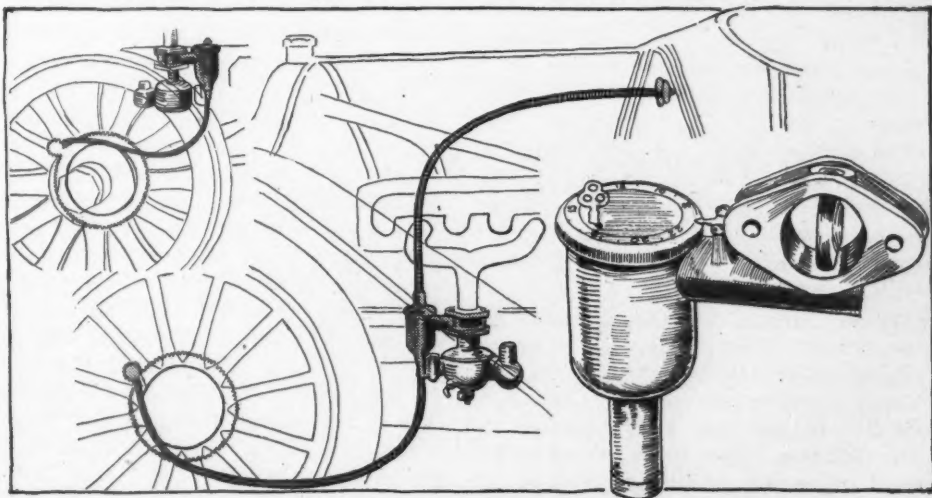


FIG. 5—PIERCE SPEED CONTROLLER AND ITS APPLICATION



Brief Business Announcements



Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS					
Town—	Agent	Make	Town	Agent	Make
Akron, Ind.	Karl B. Gast and A. A. Gast	R. C. H.	Le Roy, Kan.	P. C. Jones	R. C. H.
Albuquerque, N. M.	E. L. Bradford	R. C. H.	Lindsay, Cal.	E. C. Graham	Henderson
Alexandria, La.	W. H. Ratcliffe	R. C. H.	Lima, O.	Central Garage	Little
Baltimore, Md.	Baltimore Garage Co.	Keeton	Lima, O.	W. E. Rudy	Chalmers
Batavia, N.	Robert L. Hiller	R. C. H.	Live Oak, Cal.	Henricksen & Smith	R. C. H.
Bayonne, N. J.	W. H. Dykeman	R. C. H.	Louisville, Ky.	W. L. Lyons	Hupp-Yeats
Bay Ridge, N. Y.	Charles Frederick	Henderson	Madison, Wis.	Statz Motor Car Co.	Stoddard-Dayton
Bordentown, N. J.	Samuel F. Garrison	R. C. H.	Madison, Wis.	Statz Motor Car Co.	Cadillac
Boston, Mass.	Fred A. Dutton Co.	Abbott-Detroit	Madison, Wis.	Statz Motor Car Co.	Studebaker
Boston, Mass.	J. S. Harrington & Co.	Flanders	Mays Landing, N. J.	Harry F. Birch	R. C. H.
Boston, Mass.	Lozier Motor Car Co.	Paige-Detroit	Milwaukee, Wis.	Jonas Automobile Co.	Cadillac
Bristol, Tenn.	Cannon Electric Co.	R. C. H.	Minneapolis, Minn.	Minnesota Cartcar Co.	Cartcar
Buffalo, N. Y.	Progressive Motor Car Co.	Michigan	Nacogdoches, Tex.	Baker & Wilson	R. C. H.
Burlington, N. J.	Cortland L. Fort	R. C. H.	Northport, L. I.	D. & W. Lawson	Henderson
Canton, Ill.	Meade McClatchey	Henderson	Ottawa, Kan.	John Nelson & Son	R. C. H.
Carlsbad, N. M.	Carlsbad Auto Co.	R. C. H.	Petaluma, Cal.	J. J. Tanner	Henderson
Carlton, N. J.	Middletown Motor Co.	R. C. H.	Pittsburgh, Pa.	Forbes Motor Car Co.	Henderson
Charleston, S. C.	Automobile & Marine Motor Co.	R. C. H.	Plymouth, Ind.	F. H. Kuhn	R. C. H.
Chicago	J. G. Tennant & Co.	Henderson	Port Colborne, Ont.	Guiding Star Bicycle Store	Metz
Chicago	F. Ebann	R. C. H.	Portland, Ore.	H. L. Keats Auto Co.	Detroit
Chicago	W. G. Sporleder	R. C. H.	Rialto, Cal.	J. W. Cramp	R. C. H.
Decatur, Ill.	G. F. Wisegarver	R. C. H.	Riverside, Cal.	A. R. Riley	R. C. H.
Denver, Colo.	Colorado Cartcar Co.	Cartcar	Rochester, N. Y.	A. Elliott	R. C. H.
Deming, N. M.	Crescent Garage	R. C. H.	Rockland, Me.	Albert C. Jones	R. C. H.
East Orange, N. J.	Harold C. Slater	Henderson	Roswell, Ga.	H. A. Walton and C. W. Ellington	R. C. H.
Edmonton, Can.	Standard Motor Co., Ltd.	Henderson	Roswell, N. M.	Pecos Valley Auto Co.	R. C. H.
Elyria, O.	Jackson & Harrison Auto Sales Co.	Harford	Sacramento, Cal.	Sacramento Motor Sales Co.	Henderson
Enderlin, N. D.	W. J. Baribeau	R. C. H.	Santa Ana, Cal.	Frank Vegely	R. C. H.
Fall River, Mass.	F. W. Davis & Sons	Henderson	Scranton, Kan.	Michael & Sappenfield Garage Co.	R. C. H.
Fresno, Cal.	L. E. Crider	Henderson	Selma, Ada.	S. H. Watts	R. C. H.
Fresno, Cal.	E. W. Johnson Co.	R. C. H.	Shawhegan, Me.	Clyde H. Smith Auto Co.	Cartcar
Gilroy, Cal.	McKenney & McKenney	R. C. H.	Souderton, Pa.	Souderton Garage	R. C. H.
Golden, Ill.	Thesen & Gronewald	Henderson	Spokane, Wash.	H. J. Banta	Pierce-Arrow
Grand Saline, Tex.	B. W. Carrington	R. C. H.	Spokane, Wash.	Gerlinger Auto Co.	Warren
Green City, Mo.	Boyce & Born	R. C. H.	Springfield, Mass.	Forest Park Garage	Henderson
Hardinsburg, Ind.	May & McPheeters	R. C. H.	Stockton, Cal.	E. E. Cross	Henderson
Houston, Tex.	Northrup & Clark	R. C. H.	Swedesboro, N. J.	H. F. Hunter	R. C. H.
Howard, Pa.	Jackson Kline	R. C. H.	Toronto, Ont.	Matheson Sales Co.	King
Hubbard, Ia.	Elmer S. Maine Co.	Henderson	Tucson, Ariz.	Alfred S. Donau Auto Co.	R. C. H.
Huntington, N. Y.	Walter H. Flessel	R. C. H.	Utica, N. Y.	L. H. Gardner	Cartcar
Indianapolis, Ind.	Finch & Freeman Auto Co.	Nyberg	Utica, N. Y.	I. R. Gardiner	R. C. H.
Indianapolis, Ind.	Finch & Freeman Auto Co.	Regal	Washington, D. C.	Storm Motor Car Co.	Hupp-Yeats
Indianapolis, Ind.	Finch & Freeman Auto Co.	Marathon	Watertown, Wis.	Buroff-Fuller Motor Co.	Regal
Inverness, Miss.	Wallace & Tolar	R. C. H.	Watertown, Wis.	Buroff-Fuller Motor Co.	Overland
Jamestown, N. D.	Wallace Donnelly Co.	R. C. H.	Wenona, Ill.	H. L. Webber	R. C. H.
Janesville, Minn.	E. Dieudonne & Son	R. C. H.	Wessington Springs, S. D.	Western Machine & Motor Co.	R. C. H.
Joplin, Mo.	C. H. Back	Hupp-Yeats	Wichita, Kan.	C. A. Jones	R. C. H.
Lake Wilson, Minn.	L. L. Grier and A. S. Peters	R. C. H.	Williamsport, Ind.	John E. Briggs	R. C. H.
Lancaster, Pa.	Automobile & Supply Co.	Henderson	Windsor, Ont.	F. S. Evans	King
Lansford, N. D.	Brunner & Chambers	R. C. H.	York, Pa.	Auto & Truck Sales Co.	Henderson
Las Animas, Colo.	P. W. Pittman	R. C. H.			
TRUCKS					
Atlanta, Ga.	Cole Motor Co. of Ga.	Federal	Memphis, Tenn.	John F. Cubbins	Federal
Boston, Mass.	F. E. Wing Motor Car Co.	Marmon	Mobile, Ala.	Mobile Auto Co.	Federal
Buffalo, N. Y.	Sanderson & Burghardt	Federal	Montreal, Can.	Pope-Hartford Motor Co.	White
Columbia, S. C.	Gibbes Machinery Co.	Federal	New Orleans, La.	Fairchild Auto Co.	Federal
Larned, Kan.	W. S. Young	Federal	Pittsburgh, Pa.	Union Motor Car Co.	Federal
Melbourne, Australia	American Motor Truck & Auto Co.	Federal	Watertown, Wis.	Buroff-Fuller Motor Co.	Chase

PORT HANEY, B. C.—A garage is being built here by Charles Pellitier.

Toronto—Captain C. A. Boone has completed plans for the construction of a large garage at 159-161 Richmond street west.

Milwaukee, Wis.—Benjamin Margoles, W. A. Nash and R. M. McKay, of Milwaukee, Wis., have organized the Badger Oil and Specialty Co., which has been incorporated under the laws of Wisconsin with a capital of \$25,000.

Boston, Mass.—The Boston branch of the Buick company has been moved to the salesrooms on Massachusetts avenue and Newbury streets just vacated by the Oldsmobile company, the latter going to its new building. The Buick manager decided not to wait until the addition to the salesrooms was completed when he found

that the work was delayed and would not be done for more than a month.

Galt, Ont.—A. E. Dunn has opened a new and more commodious garage.

Calgary, Alta.—The Sayer Auto Co. has taken over the Motor Mart garage on Sixteenth avenue. A charging station for electric cars is being installed.

Springfield, Ill.—The Sangamon Electric Co. expects to take possession of its new building this month which will add 20,000 square feet to the capacity of the plant.

Milwaukee, Wis.—The Jonas Automobile Co., 421 Wells street, Milwaukee, will on October 15 take possession of the new Cadillac building now being erected for the firm at the corner of Eighth and Wells streets. The new structure will be devoted exclusively to the sale and service of Cadillac cars, which the Jonas company has rep-

resented continuously for 11 years in Milwaukee and the surrounding territory.

Saskatoon, Sask.—The Clinton Motor Co. is negotiating regarding a site here.

Vancouver, B. C.—The announcement is made of J. G. Cline's appointment to the sales branch of the Vancouver branch of the Ford Motor Co.

Toledo, O.—The Ford Brothers Co., agent for the Michigan, has added the Krit line and will represent fourteen northwestern Ohio counties.

Racine, Wis.—The Wadewitz Machinery Co., of Racine, Wis., incorporated a few weeks ago with \$50,000 capital, is establishing an experimental shop at Racine for the practice of motor car engineering and the manufacture of devices for the general mechanical engineering field. One of the principal devices already perfected and to

be manufactured without delay is a spring starter for motor car engines.

Port Credit, Ont.—Plans have been filed for a garage to be erected here for C. H. Gordon.

Atlanta, Ga.—The Studebaker Corporation has arranged for a four-story, fire-proof building at the corner of Peachtree and Harris streets for its Atlanta branch.

Niagara Falls, Ont.—A new garage has been opened here on Bridge street, next to the Windsor hotel, by Robert Hamilton, who is the local agent for the Studebaker line.

Winnipeg, Man.—The Reo agency has been transferred from Joseph Maw & Co. to Percy Plewes. Mr. Plewes was previously in charge of the sales department of Maw & Co. for 13 years.

Boston, Mass.—The Paige-Detroit is no longer handled in Boston by the Morse Motor Car Co. It is now being marketed from the Lozier salesrooms under the direction of the Lozier branch.

Boston, Mass.—The Berkeley Motor Car Co. has just been formed in Boston by J. H. Freeman, formerly with the Cadillac, as manager, and George Tollman of the Chalmers, to deal exclusively in used cars.

St. Catharines, Ont.—The Reo Sales Co., of St. Catharines, has made arrangements with the Reo Motor Car Co. of Canada, of St. Catharines, whereby it has become the sole selling agent for the Reo throughout the dominion of Canada.

Boston, Mass.—John S. Harrington & Co., Boston agents for the Flanders gasoline cars, has taken on the agency for the Flanders electric for New England. It was formerly sold here through a branch but this was discontinued some months ago.

Washington, D. C.—The Potomac Motor Car Co., agent for the Marmon, has taken temporary quarters at 1313 H street, northwest, pending the completion of its new salesrooms at 1226 Connecticut avenue, northwest. The building will be ready for occupancy November 4.

Toledo, O.—The Moore Motor Truck Co.'s line of commercial vehicles has been placed on sale by Fred Kopf, Toledo sales agent. Following are the officers of the Toledo company: President and manager, T. E. Moore; vice-president, F. B. Adams; secretary and treasurer, D. W. Bliss; superintendent, C. W. Blanchard. The company is figuring on building large shops near Toledo.

Racine, Wis.—Leo A. Peil, president and general manager of the Mitchell Automobile Co., Racine, Wis., has been appointed general sales manager of the Mitchell-Lewis company to succeed William L. Day, who has resigned to accept the position of general manager of the General Motors Truck Co., at Pontiac, Mich. Mr. Day came to Racine in April, 1911, to succeed James Gilson as general sales manager. Mr. Peil assumes his new duties on September 1.

No change will be made in the management of the distributing concern of which he is the head.

Moose Jaw, Sask.—The Canadian Garage Co. is building a fine garage at a cost of \$25,000.

Pembroke, Ont.—The Thomas Pink Co., Limited, has added to its already large premises a motor garage where all kinds of repairs will be made.

Montreal—The Gutta Percha Co. of Canada, dealer in rubber tires for motor cars, has purchased outright the business of the Rubber Tire Wheel Co. of Montreal.

Canton, O.—A building permit has been issued for the erection of a \$10,000 plant on Deuber avenue, for the Cleveland-Canton Spring Co., which will make all kinds of vehicle springs.

Toronto—G. L. Mitchell has resigned the managership of the Toronto branch of the Diamond Rubber Co. to become partner in the Republic Rubber Co., Detroit, Mich.

St. Catharines, Ont.—The Reo Sales Co., St. Catharines, has completed arrangements with the Reo Motor Car Co. of Canada whereby the former concern secures sole selling rights for the Reo in Canada.

Portland, Ore.—H. A. Jurgewitz has been appointed Portland manager of the Goodyear tire branch. He succeeds W. T. Powell, who has been made Pacific coast district manager for the Goodyear people, with headquarters in San Francisco.

Milwaukee, Wis.—The Lozier Livery Co. has been organized and incorporated for \$25,000 to operate a motor livery service. Richard H. Knowles is president and general manager, and with him are associated in the enterprise R. P. Druecker and F. W. Loomis.

Boston, Mass.—Frank J. Tyler and his brother Lucius, the former manager of the United Motors Boston Co. for some years and the latter manager of the Maxwell branch until recently, have formed the Tyler Motor Car Co. to handle cars and trucks in New England with headquarters at Boston.

Vancouver, B. C.—The two-story garage which is being built for the McLaughlin Carriage Co., Ltd., on Georgia street, between Butt and Jarvis streets in Vancouver, is nearing completion. The building is 66 feet by 132 feet and was started last March. It is of reinforced concrete construction, entirely fireproof and brick-faced.

Buffalo, N. Y.—The A. W. Haile Motor Co., capitalized at \$25,000, has been incorporated. Directors of the new corporation are Arthur W. Haile, Bradley H. Phillips and E. C. Schlenker, all of Buffalo. Arthur W. Haile, president of the new motor company, for the past 2 years has been local sales agent for Studebaker and has received notice from the Studebaker corporation of Detroit, Mich., that he is to continue the selling end for

Studebaker cars in Erie and Niagara counties.

Edmonton, Alta.—The Motor Accessories Co. has commenced business in this city.

Owen Sound, Ont.—W. J. Linden and James Newton have opened a large garage on Ninth street.

Vancouver, B. C.—The H. W. Welsh Auto Co. has opened a salesroom and garage at 837 Pender street west, where it is featuring the Chalmers.

Hull, Que.—The provincial government of Quebec has granted the charter which was applied for by the Hull and Ottawa Garage Co., with headquarters here, recently.

Omaha, Neb.—Tom Bromwell, who for several years has been sales manager for the H. E. Fredrickson company, has resigned to accept a like position with the Nebraska-Cartercar Co.

Victoria, B. C.—The Vancouver Island Auto Co., of this city, has been succeeded by the Vancouver Motor Co., Ltd.

Toronto—The Matheson Automobile Co. with temporary showrooms and garage at 170-176 Victoria street while its own garage is building, is sole Canadian distributor for the Norwalk and Nyberg cars.

Detroit, Mich.—George H. Wahl, for 5 years with the Ford Motor Car Co., has taken the Michigan state agency for Rambler cars. He has quarters formerly occupied by the Chalmers Motor Co.'s retail branch on Jefferson avenue.

Boston, Mass.—The Edison battery agency, formerly handled in Boston by the S. R. Bailey Co., maker of Bailey electric, at 895 Boylston street, is now being handled in Boston by the Herbert S. Potter Co., 24 Commerce street, with George Holden as manager.

Springfield, Mass.—The Essenkey company of Chicago that recently opened a place in Boston has done so well that salesrooms for the product have been opened now at Springfield, Mass., at the corner of Fort and Water streets. It is known as the Western Massachusetts Essenkey Co.

Portland, Ore.—Portland is experiencing many changes on motor row. Many agencies have changed, or are about to change hands. New agencies have been formed and one firm has taken on an entirely new car in the Oregon territory. Probably the most important change is the establishing in Portland of a factory branch of the Pierce-Arrow. Howard M. Covey, who has handled this line in Portland for several years, will in the future confine himself exclusively to the Cadillac line. S. G. Colter, who has had charge of the Pierce-Arrow department for Mr. Covey, will have charge of the Pierce branch and will occupy new salesrooms and garage until the factory is completed. W. H. Gray, formerly manager of the Diamond tire branch in Portland, has resigned to associate himself with Fred Vogler in the handling of

Hudson and Reo cars. The Hudson was formerly handled by Neate & McCarthy.

Picton, N. S.—Dodd Dwyer has opened a garage on Creighton street. He also has the local Ford agency.

St. Paul, Minn.—Denial is made by Smith & Heberle that they have taken the Hudson agency for Minneapolis. They handle only the Chalmers.

Davenport, Ia.—R. E. Beedee of this city has accepted the position of assistant general manager of the St. Louis branch of the Wilcox Motor Car Co. of Minneapolis.

Montreal—The Automobile Owners' Exchange is the name of a concern recently established at 730 Dorchester street west, to handle accessories. J. J. Hoag has been appointed sales manager.

Vancouver, B. C.—In a few days work will commence on the erection of a two-story fireproof garage, to be erected in the 1200 block on Hornby street for H. Hemlow. The structure will cost \$30,000.

Detroit, Mich.—The Michigan State Automobile School has just been incorporated with a capital of \$10,000. The school is situated at 11-13-15-17 Selden avenue, and has been in operation for a year and a half.

Omaha, Neb.—F. W. Kemp, formerly with the E. K. Wilson Auto Co., has taken the management and a third interest in the Independent Auto Repair Co. D. J. O'Brien and Adolph Storz are the others interested. Mr. Kemp will also look after the sales department of the Firestone-Columbus Motor Car Co.

Winnipeg, Man.—A contract has been closed between the Canadian Fairbanks-Morse Co. and the International Motor Co. of New York for the sole Canadian representation of Mack trucks. The agreement between the two companies provides for the establishment of a chain of service stations throughout Canada, the principal of which will be at Montreal, Toronto, Winnipeg and Regina. The Winnipeg station will be built immediately and the control of the plant will be under the direct supervision of C. J. Britton, manager of

the western Canada business of the Canadian Fairbanks-Morse Co.

Port Arthur, Ont.—A fireproof garage, constructed of brick and concrete, has been opened on Park street by W. Foote.

Coshocton, O.—Snyder & Senft have purchased the garage and sales agency on Third street, Coshocton, formerly conducted by Charles W. Loos & Sons.

Portland, Ore.—The Ford company has secured space in the Paquet building at East Eighth and Hawthorne streets for the purpose of establishing a factory branch October 1.

Montreal—J. W. Baillargeon, president of the Autobus Co., has been chosen president of the Fearless Tire Co., organized to manufacture and market a leather tread steel-studded tire.

Racine, Wis.—The Anderson Brothers garage at Racine, Wis., has been purchased from William Anderson by Paul Klauder and Emil Hansen. The garage and repair shop facilities will be increased at once.

Detroit, Mich.—Henry Lumbach, assistant engineer of the R. C. H. Corporation, has resigned to accept a position with the Studebaker Corporation as chief tool maker. His resignation took effect September 1.

Columbus, O.—The Columbus Auto Inn located at High street and Seventh avenue, has completely renovated the garage and salesroom at that place. The concern consists of two floors and the equipment is complete.

Tacoma, Wash.—The A. S. French Auto Co., the Columbia Taxicab Co., the Vancouver Transfer Co. and the Victoria Transfer Co. of British Columbia have recently consolidated with a capitalization of \$500,000. The new company will be known as the Pacific Auto Co., with E. H. Heaps, who formerly was head of two of the companies, president of the new concern. The new company will maintain a taxicab service in Vancouver and Victoria, and it also is probable that a similar service will be inaugurated in New Westminster. The following have been named as directors: Noel Humphreys, managing

director, G. M. Gibbs, A. S. French and J. L. Langan.

Toledo, O.—The Saxon Mfg. Co. has established a branch at 1219 Woodward avenue. I. E. Lowenberg, manager.

Toronto—The K. and S. Tire Co., Yonge street, has been appointed sole distributor for the dominion of Canada for the Kelly-Springfield motor truck tires.

Cleveland, O.—The Marathon Tire and Rubber Co. of Cleveland, O., has filed papers with the secretary of state increasing its capital stock from \$10,000 to \$100,000.

Seattle, Wash.—The new Stutz agency in Seattle will be located in the new Lozier building at 909 East Pike street. The agency will be handled by W. P. Brawley and C. H. Moore.

Vancouver, B. C.—Work has been started on the reinforced concrete frame of the fireproof garage that is being erected on the corner of Thurlow and Georgia streets for the Begg Motor Co.

Montreal—The Peerless Tire Co. has formed in Montreal, headed by J. W. Baillargeon, president of Autobus Co., and J. A. Michaud, of the Vinot Car Co. of Canada, to manufacture and market tires.

Boston, Mass.—Manager C. S. Wheeler of the Boston branch of the R. C. H. has moved the service station of the branch from 148 Berkeley street to 16 Harcourt street, a more convenient location with larger space.

Utica, N. Y.—The Bossert Co., maker of sheet steel stampings, is constructing an addition two stories in height, the upper floor to be used for offices. This concern recently installed an autogenous welding plant and is increasing all departments.

Toronto—Gerard Muntz, director of the Schacht Motor Car Co. of Hamilton, has been chosen president of Consolidated Motors, limited, which has located its new establishment at 112-116 Richmond street west. Consolidated Motors has secured agencies for the Panhard car, Detroit, Motor Wagon and the Schacht car.

Augusta, Me.—Hallett Vehicle Tire Co., capital stock, \$500,000; to manufacture, sell and deal in rubber articles; incorporators, L. J. Coleman, E. Perry.

Augusta, Me.—United Motor Equipment Co., capital stock, \$1,000,000; to manufacture, sell and deal in motors, etc.; incorporators, E. M. Leavitt.

Baldwin, N. Y.—Auto Rental Co., capital stock, \$5,000; directors, G. Wentjen, A. Melselbach, A. C. Ewing.

Boston, Mass.—Standard Auto Supply Co., capital stock, \$100,000; incorporators, M. F. Culliney, E. W. Shepherd.

Boston, Mass.—Fenway Garage Co., capital stock, \$250,000; incorporators, J. C. Cannon, C. W. Engle.

Chicago—Parker Motor Co., capital stock, \$5,000; to manufacture motors; H. W. Schnetzky, F. D. Parker, A. E. Cole.

Chicago—Hart Motor Car Co., capital stock, \$25,000.

Chicago—Republic Motor Co., to manufacture and sell engines and appliances; incorporators, W. H. Watson, L. E. Powell, P. H. Gullfoil.

Recent Incorporations

Elizabeth, N. Y.—Franklin Auto Co., capital stock, \$25,000; incorporators, W. H. Reynolds, M. Gordon, L. Koplan.

Indianapolis, Ind.—Hydraulics Transmission Co., capital stock, \$200,000; to manufacture transmissions; directors, W. K. Enest, P. Mihilland.

Indianapolis, Ind.—McLellen Auto Shop, capital stock, \$50,000; to deal in motor cars; directors, E. J. Kane, F. E. Brret, T. E. Byrne.

Indianapolis, Ind.—Mals Motor Truck Co., capital stock, \$1,000,000; incorporators, W. M. Pearce, A. S. Lockard, W. H. Brown.

Lansing, Mich.—Boucher & Coffman Auto Company.

Nashville, Tenn.—Cumberland Motor Co., capital stock, \$10,000; incorporators, W. D. Caldwell, J. H. Check, J. O. Check, Jr.

New York—Triple Action Carburetor Co., capital stock, \$200,000; to manufacture carburetors, motors; directors, M. Welwoda, F. Hodschar, E. F. Driggs.

New York—Curran Patent Co., capital stock, \$10,000; to manufacture motors, etc.; directors, H. L. Curran, C. H. Wilson.

New York—People's Motor Sales Co., capital stock, \$15,000; to deal in motor cars and conduct a garage; directors, J. T. Shultz, F. H. Humphries, A. L. Allen.

New York—Volkmar Mfg. Co., capital stock, \$100,000; to manufacture automatic starting devices; directors, E. Giegerich, B. Volkmar, W. H. Giegerich.

Pittsburgh, Pa.—Universal Shoe and Forge Co., capital stock, \$50,000; to manufacture motor car parts; C. H. Ehlers, president.

Stanford, Tenn.—Osceola Garage Co., capital stock, \$10,000; incorporators, H. Clay, C. Hyatt, J. J. Griffin.

Union, N. J.—Ideal Auto Garage Co., capital stock, \$100,000; incorporators, E. F. Smith, F. W. Ritter, W. G. McLoughlin.

Wilmington, Del.—Overman Tire Co., capital stock, \$3,000,000; to manufacture motor cars; incorporators, E. E. McWhitney, N. P. Coffin, H. E. Latter.